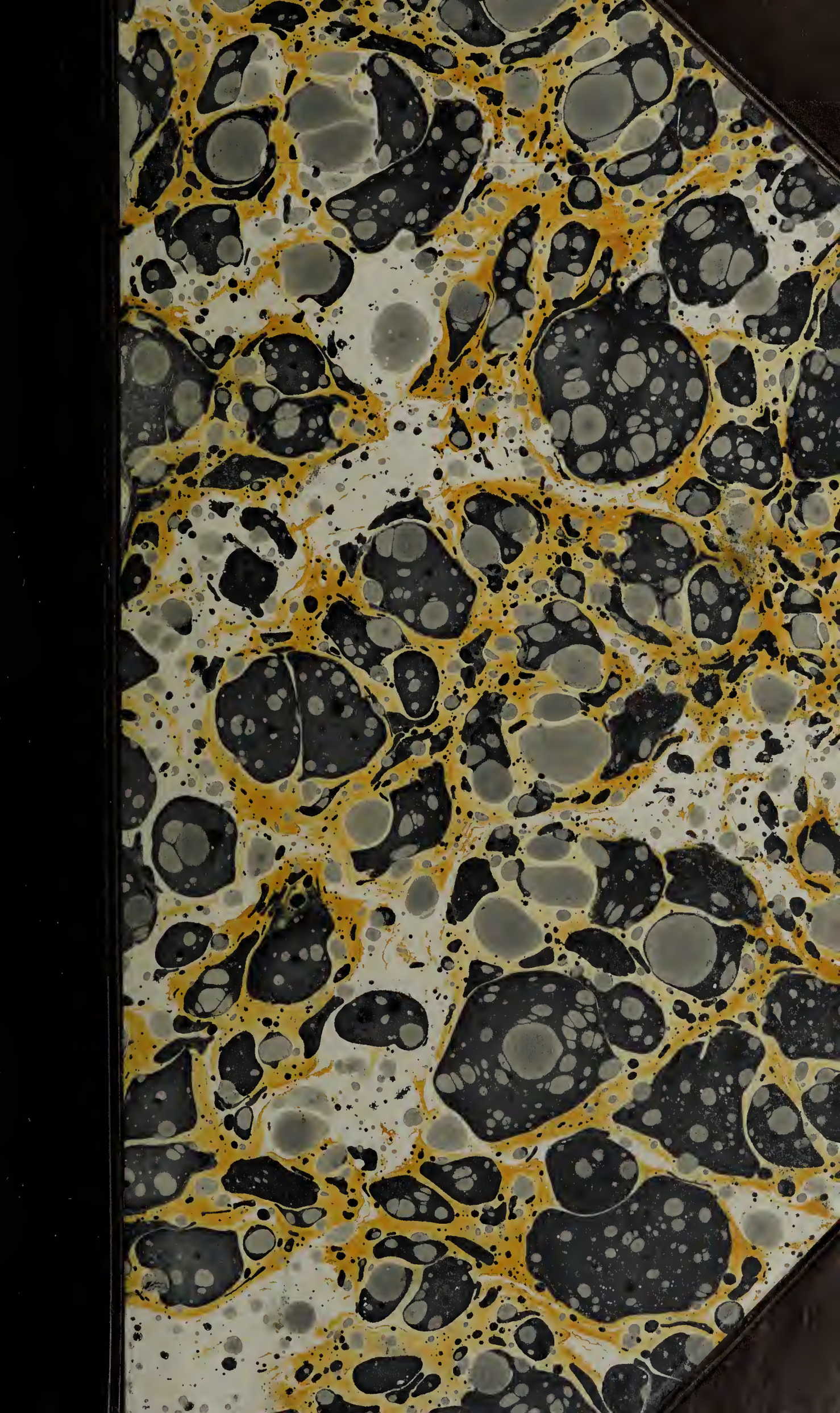

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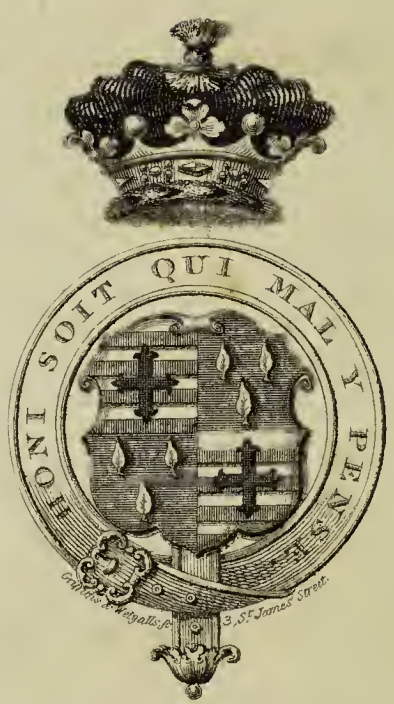

The Marquis of Stafford.

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16766

TRANSACTIONS

OF THE

SOCIETY,

INSTITUTED at LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE,

WITH THE

PREMIUMS offered in the YEAR, 1783.

VOL. I.

LONDON:

Printed by JAMES PHILLIPS, George-Yard, Lombard-Street, and Sold by Messrs. DODSLEY, LOCKYER DAVIS, WHITE, BECKETT, JOHNSON, CADELL, ELMSLY, WALTER, RICHARDSON and URQUHART, and DEBRETT.

M.DCC.LXXXIII.

WELLCOME
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MEDICAL
LIBRARY

Lucy Dodds London

Society for the Encouragement of Arts
anufactures & Commerce, The public Spirit
this Age is perhaps in no instance more
markably shewn, than in the flourishing
ndition of this Valuable Society, whose
le object is the improvement of the polite
Commercial Arts in all their various branch
exciting industry & emulation amongst
who can be moved either by honorary or
uniary rewards, It was set on foot by
rd Folkstone, Lord Romney, Dr Hales,
even or eight private gentlemen, who
e brought together by the unwearied pains
Mr William Shipley, a person little known
had long laboured to reduce into practice
heme he had projected for this purpose
i first meeting was at Rath Mills'
house, March 22. 1754 when those Noble
d approved & patronized the undertaking
their next meeting they determined to
e a beginning, by proposing rewards for
discovery of Cobalt, for the Encouragement
ys & Girls in the Art of drawing (thereby
nprove manufactures in taste & Elegance
r the planting of Madder in this Kingdom
w money being wanted, a voluntary
scription was begun, to which Gt Noblemen

before Named, did not only generously Contrib
much more than they woued let appear, bu
engaged moreover to make good the deficiency a
the End of the Year; A promise they most
honourably fulfilled; soon after this, a Plan
was drawn up by one of the Members,
(Mr Baker) for forming, regulating & Govern
the Society; which being printed & dispersed
the great Utility of Such a Society became
well understood, that Immediately Sever
Noblemen & Gentlemen offered themselves
Members, & ever since that time its Inc
has been so Extraordinary, that it Consis
at present of Above 1000 Members, many o
whom are of the greatest Quality & Fortune
& it can now afford to offer Premiums to
Amount of Near 2000 Pr Annum ——

The Officers of this Society are a Pres
, Eight Vice Presidents, a Register, & Secre
& these are to be Chosen by ballot Annua
On the first Tuesday in March, Every
Person desiring to be a Member of this
Society, must be proposed by some memb

of the Same, at one of their Meetings

By delivering in the Name, Addition, &
lace of Abode of such Person, Signed by
himself; which must be read by the Secreta
balloted for at the next Meeting; & if two
hirds of the Members then Present are for
dmitting such person, he shall be Deemed
perpetual Member on payment of Twenty
Guineas, or a Subscribing Member on payn
f any Sum not less then two Guineas, &
ontinuing such Payment Annually, but
o two Guineas A Year is the most
mmon Subscription; all the Members that
re Noblemen, & even some Gentlemen
ubscribe Five Guineas; & several Others
our or three; There are also Ladies the
e Subscribers, eminent Foreigners are
kewise Admitted to be Honorary Member
t first they had a Treasurer, but now
eir Money is placed in the bank of Englan
the Names of the President & the Vice
residents, three whereof are empowered to

aw any Sum the Society shall Order to be
d, & the Accounts of the Receipts & payment
Constantly Examined & balanced on the
st day of every Month by a Committee

Appointed for that purpose; Their proceedin
are Regulated by a Body of Rules & Orders
Established by the Whole Society, & printed
for the use of the Members; all Questio
& debates are determined by holding up
hands, or by Ballot if required, & no matt
can be Affirmed Without the Assent of t
Majority at two Meetings; They Invite a
the World to propose Subjects for encourage
& whatever is deemed deserving Attention
referred to the Consideration of a Committ
which after due Enquiry & deliberation m
their report to the Whole Society, where
is Approved, rejected or Altered. A list
printed & published every Year, of the
Matters for which they Propose to giv
Premiums, which premiums are either
of Money, & those sometimes very Con
-able ones, or the Society's Medal in go
or Silver, which they Consider as the
greatest honour, they can Bestow, all

possible Care is taken to prevent partia
in the distribution of their Premiums,
desiring the Claimants Names, may b
Concealed, & by Appointing Committees

ho when they find occasion to call their
istance the most Skilful Artists,) for the
rict Examination of the Real Merit of
Matters & things brought before them,
Consequence of their Premiums —

The Societys Office is Opposite to
Beaufort Buildings in the Strand; their
eetings are Every Wednesday Evening at
x O'Clock, from the Second Wednesday
November to the last Wednesday in
ay; & at other Times on the first &
hird Wednesday of Every Month, They a
eedingly well Attended, & its pleasing to
hold ~~it~~ with how laudable a Zeal every o
ndeavours to promote the public good, by
couraging whatever may improve the
s & Manufactures, or increase the
mmerce of this Kingdom & its Colonies,
ey are not incorporated, nor seem me
want a Charter, as their Business
n be carried on very well without one,
the Expence would be to Considerable, bu
is hoped their generous disinterested
ntentions, & their Extensive Views to pro

The Trade, the Riches & honor of t
Country, will in time recommend the
to participate the Royal Bounty, & tha
they will long Continue to Prove them
-selves to be, what they are at Preser
as respectable & useful a Society as
ever was Established in any Nation -

ADDRESS TO THE PUBLICK.

ADELPHI, MAY 28th, 1783.

THE Society have found it expedient to vary, in ſome reſpect, the mode of conveying to the publick their proceedings in future; and for that purpoſe to publiſh annually their tranſactions, which will include an extenſive ſeries of valuable information, communicated to the Society from time to time, ſince its firſt eſtabliſhment, on a variety of ſubjects of great national importance. The teſtimonials contained in the following pages, demonſtrate the eminent ſervices the Society has rendered to the community at large, and the Preſident, Vice-Preſidents, and the other members cannot but be ſolicitous for the ſucceſs of an inſtitution founded on ſuch beneficent prin ciples; nor can they with-

hold their warmeſt recommendations of it to the protection of every friend to the real intereſts of the Arts, Manufactures, and Commerce, of the Britiſh empire.

The general attention being now directed towards a very ſignal exertion in the line of the Polite Arts, evinced in a work which decorates the great room of the Society, the preſent time has been choſen as moſt ſuitable for beginning this mode of communication to the publick.

Signed in the name, and by order of the Society,

SAMUEL MORE, Secretary.

INTRO-

INTRODUCTION.

THE Society for the encouragement of Arts, Manufactures, and Commerce, having been eſtabliſhed on the moſt diſintereſted principles, and actuated by the moſt liberal motives, (the benefit of mankind in general, and of their country in particular); it may be ſatisfactory to the publick, to take a general view of their tranſactions, and examine into ſome of the good effects produced by their laudable endeavours.

To effect this purpoſe, the Society have reſolved to change the mode in which their annual book of premiums has been hitherto printed, and inſtead of publiſhing only a number of advertiſements, to add at the end of each claſs a few ſelect papers communicated to them, and which have reference to that claſs to which they are annexed,

nexed, and thus every year produce to the publick, ſome of the diſcoveries which have come to their knowledge, reſpecting inventions or improvements made in the various matters which have been objects of their attention and conſideration. This, it is preſumed, will furniſh an uſeful and entertaining work, ſerving to communicate the labours of the ingenious of one part of the Britiſh dominions, to the inhabitants of the other; a plan, which it is hoped, will appear very eligible to all, but particularly to thoſe who have obſerved the ſlow progreſs with which uſeful knowledge is diſſeminated.

In the year 1777 a committee was appointed to examine the proceedings of the Society, from its inſtitution to the year 1776, incluſive, who carefully extracted the ſeveral articles for which premiums or bounties had been given, and arranged them under the reſpective claſſes to which they belong; diſtinguiſhing, in different columns, the year when, and the perſons

to

to whom, ſuch rewards were adjudged; if pecuniary, the ſum; if honorary, of what kind.

This enabled the Society, in the year 1778, to print a work in folio, entitled, "A Regiſter of the Premiums and Boun-"ties given by the Society, inſtituted at "London, for the encouragement of Arts, "Manufactures, and Commerce, from the "original Inſtitution in 1754, to the year "1776, incluſive."

As this work was more immediately intended for the uſe of the members, who are each entitled to a copy, it has been judged proper to lay before the publick at large, the ſummary abſtracts of the ſeveral rewards given in the different claſſes into which that work is divided, adding thereto the honorary and pecuniary rewards which have been beſtowed by the Society ſince that publication; thereby ſhewing at one view, the ſums of money expended, and the honours conferred, with a deſign

of

of promoting the Arts, Manufactures, and Commerce of this country.

It would have enlarged this volume beyond its intended ſize, to have pointed out the publick benefits derived from each article; but ſome of thoſe which have been productive of great national and commercial advantages, are more particularly mentioned in the obſervations annexed to each claſs.

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CONTENTS.

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TRANSACTIONS

OF THE

SOCIETY,

INSTITUTED at LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE.

SUMMARY ABSTRACTS

OF THE

REWARDS

BESTOWED BY THE

SOCIETY,

From the INSTITUTION in 1754, to 1782, inclusive;

WITH

OBSERVATIONS

ON THE

EFFECTS OF THOSE REWARDS,

Arranged under the several Classes of

AGRICULTURE, CHEMISTRY, COLONIES and TRADE, MANUFACTURES, MECHANICKS, POLITE ARTS,

AND

MISCELLANEOUS ARTICLES.

A

SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

AGRICULTURE.

	Pecuniary		Honorary Medals.	
	£.	s.	Gold	Silv.
For the encouragement of planting to raiſe Timber Trees, viz. Acorns, Oaks, Alder, Aſh, Cheſnut, Elm, Poplar, Larch, Plane Tree, Willow, and Fir Timber.	50		45	14
For Machines of a new Conſtruction, to be uſed in Huſbandry, viz. for ſlicing Turneps, Ploughs, Drills, Horſe-hoes, Ox-yoke, &c. beſides ſome others to be found in the Claſs of Mechanicks.	397	17	6	2

	Pecuniary		Honorary Medals	
	£.	s.	Gold	Silv.
For improved modes of cultivating ſeveral ſpecies of Wheat, Barley, and curing ruſt therein, &c.	103	3	4	4
For cultivating ſeveral ſpecies of Graſſes, viz. Burnet, Dutch White Clover, Lucerne, &c.	464	17	4	
For planting, cultivating, and curing Madder.	1516	13	2	
For improved modes of feeding and rearing Cattle and Poultry, together with the culture of Cabbage, Carrots, Parſneps, Potatoes, Turneps, &c.	161	16	8	6
For managing Bees for the increaſe of Honey and Wax.	145		4	3
For raiſing Hemp in Great-Britain.	420			

For

	Pecuniary		Honorary Medals	
	£.	s.	Gold	Silv.
For raiſing and curing Rhubarb.			3	2
For a method of deſtroying the Red Spider in Gardens, and Hot-houſes, &c.	22	2		
For improving Waſte Land.			1	
£	3281	8	77	31

OBSERVATIONS

On the Effects of Rewards beſtowed in the

CLASS OF

AGRICULTURE.

TIMBER.

THE national benefits to be derived from improvements in Agriculture, made it an early object of the attention of the Society: it engaged them to extend their premiums and bounties largely to candidates in this claſs; and the ſeveral articles for which they have been given, point out, in a great meaſure, their utility. The raiſing, planting, and preſerving Trees proper for Timber, particularly Oak, in a commercial and maritime kingdom, where it is ſo much in demand, have been greatly promoted by the premiums they have offered; and the effects may in ſome degree be obſerved from the quantities for which the ſucceſsful candi-

dates

dates have obtained them, though no account has been taken of the quantities raiſed or planted by the unſucceſsful ones.

H E M P.

Hemp being an article eſſential to our ſhipping, and of the higheſt importance to us as a maritime and commercial people, the culture of that plant has been carefully attended to, and the practicability of growing it to advantage in Great-Britain, clearly demonſtrated; a matter, which if ever we ſhould be engaged in war againſt thoſe nations by whom that article has been hitherto ſupplied, will hereafter prove of ſingular benefit to this country.

G R A I N.

Improvements in the culture of moſt kinds of Corn and Graſs-Seeds have been diligently ſearched for, and in many articles happily found.

Very conſiderable improvements in ſeveral of the common utenſils of Huſban-

dry, and others entirely of a new conſtruction, have not only been obtained, but their utility experimentally proved by the Society; and many of theſe, in large, and the models of others, have been placed in their repoſitory, for the inſpection and uſe of the publick.

FOOD FOR CATTLE.

The diſcovery of a food for Cattle and Sheep during the ſpring months, has ever been conſidered as a ſubject of the firſt importance in Agriculture; the Society therefore began at an early period to turn their attention towards it, and in hopes of obtaining ſo deſirable an object, many rewards were beſtowed for the culture of ſuch plants as make an early appearance, as Burnet, Lucerne, &c. At length the wiſhes of the Society were in a great degree gratified, by ſome accounts received of the uſe of the Turnep-rooted Cabbage, or, as it is ſometimes called, Reynolds's Turnep, from its having been firſt cultivated for

theſe

theſe purpoſes, by the late Mr. John Reynolds, of Adiſham, in Kent, who was rewarded by the Society for the diſcovery, and whoſe papers on this head have been already printed. Yet the culture of this valuable vegetable was long confined to Kent, and a few adjoining counties; but it will be found by the letters of Mr. Tugwell, and Mr. Robbins, publiſhed in this volume, that the cultivation of the Turnep-rooted Cabbage has now ſpread itſelf into Glouceſterſhire: of what great utility it will prove to the farmers in that county, is eaſy to determine; and as the knowledge of the uſes of ſo valuable a plant will now be ſpread over the whole kingdom, there is every reaſon to believe its culture will extend, and the benefits reſulting from it be univerſally felt.

MADDER.

Madder, an eſſential article in dying and callico-printing, which had been raiſed to an extravagant price by the foreign grow-

ers

ers and importers, on a ſuppoſition that it could not be brought to any degree of perfection in this kingdom, has been very ſucceſsfully obtained by the conſiderable premiums given for that purpoſe; and the Engliſh Madder, produced in conſequence, was found as good, at leaſt, if not better, than any imported.

As the culture of this article is attended with great expenſe, the Society was apprehenſive that the payment of tithes in kind might counteract the good effects otherwiſe to be expected from their premiums: ſome of their members, who had ſeats in parliament, applied to the legiſlature, and obtained an act, by which the payment of tithes for Madder was fixed at five ſhillings per acre.

By the removal of this obſtacle, and a continuation of rewards from the Society, the effect principally required has been fully obtained: foreign madder is reduced to a reaſonable price, and likely to continue

nue ſo, as the growers in Holland, and other countries from whence it is imported, are thoroughly convinced that we can ſupply ourſelves with any quantity, and of the beſt kind, whenever, by an advance of the price, the profits are found ſufficient to engage the attention of our huſbandmen. Our dyers and callico-printers have been greatly benefitted, and the nation has ſaved many thouſand pounds, by the reduction of the price of this article.

A SUMMARY

A SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

CHEMISTRY.

	Pecuniary £.	s.	Honorary Medals Gold	Silv.
For improvements in Dying and Tanning, Train Oil, &c.	550		2	1
For making Crucibles, Retorts, and importing Black Lead for making Melting Pots.	211			
For Sal Ammoniac, Verdigris, and ſubſtitutes for Borax and Verdigris.	211	10		1
For making Enamel, Glaſs for Achromatick Teleſcopes, Glaſs for Glazing Prints, and Varniſh.	166	5		

For

	Pecuniary		Honorary Medals	
	£.	s.	Gold	Silv.
For discovering Cobalt, making Zaffre and Smalt, improving British Iron, Tinning with Pure Tin, White Copper, and Leaf Metal and Bronze.	174		1	1
For cleansing Carvings in Ivory, improving the Digestor, securing the health of Water Gilders, and making Slow Match.	78	15		
	1391	10	3	3

OBSER-

OBSERVATIONS

On the Effects of Rewards beſtowed in the

CLASS OF

CHEMISTRY, DYING, and MINERALOGY.

COBALT.

THE diſcovery in theſe kingdoms of the mineral ſubſtance called Cobalt, from which Zaffre and Smalt are prepared, was a very early object of the attention of this Society: and though their expectations, that a mine of it would have been worked, have not been gratified; yet by the ſeveral premiums offered and beſtowed in order to promote that deſign, this good effect has followed, that a mine has been diſcovered, though not worked, and that the miners, aſſayers, and chemiſts of this country are become much better acquainted with the nature of Cobalt, and the

the manner of preparing Zaffre and Smalt from it, than they were before. And as it is well known, that there are other mines, or, at leaſt, ſome veins of this ſubſtance in Cornwall, Devonſhire, and alſo in Scotland, and probably in other parts of the kingdom, it promiſes, in time, to become a matter of very great and profitable importance. For when it is conſidered that all the Cobalt uſed in our manufactories, and nearly all the Zaffre and Smalt conſumed here, are imported at a large expenſe from abroad; the diſcovery of the original material, and making the preparations from it, will open a new buſineſs, and eſtabliſh a manufacture, which has hitherto taken place here only on a ſmall ſcale. Great quantities of Smalt imported, as has been obſerved, from abroad, are uſed under the name of Powder Blue, in waſhing linen; and very large quantities of Zaffre are annually ſent to China, for the uſe of their manufacturers. Much of the Zaffre brought to England is

mixed

mixed with matters that debaſe its quality, and injure its colours; and as the manner of preparing it from Cobalt is now well known in England, and as all mixture of foreign matter may be eaſily avoided, there is not a doubt, that if a mine of Cobalt ſhould be properly worked in this kingdom, that material, ſo uſeful in our manufactures, and of ſo much conſequence as an article of commerce, may be prepared here in a more accurate manner than has hitherto been practiſed abroad.

CRUCIBLES and RETORTS.

As all Crucibles and earthen Retorts uſed by chemiſts, aſſayers, and melters of metals, were imported from abroad, the Society thought the diſcovery of proper materials for manufacturing them in this country, was an object well worthy of conſideration; and having beſtowed ſome few rewards for that purpoſe, were pleaſed to find that a manufactory for making theſe

veſſels

veſſels was eſtabliſhed at Chelſea; where they are not only made for home conſumption, but conſiderable quantities have been exported. It may be here obſerved, that thoſe kind of Crucibles or Melting Pots, called Black Lead, or Blue Pots, which are the only ſorts made uſe of in Cornwall for aſſaying Tin Ores, were not to be obtained from any part of Europe, except a ſmall place called Hafner's Zal (i. e. Potters Place) or Paſſou near Rehgenſburg in Germany, where the only manufactures of this kind were carried on. This inconvenience laid the tin ſmelters in Cornwall very frequently under great difficulties, not only with regard to the advanced price in time of war, but for want of an importation of the pots, a ſtop has often been put to many of their works.

The Society have the ſatisfaction to find by certificates from ſome of the moſt reſpectable aſſay-maſters in Cornwall, that in conſequence of their attention and Rewards, a manufacture of pots, fully anſwering all

their purpoſes, is now eſtabliſhed at Chelſea; and many of the principal refiners, and the workmen at the mint, uſing no other than what are made there, the moſt ſanguine wiſh the Society had on this important object has been fully gratified.

TANNING with OAK SAWDUST.

The reward given by the Society to the perſon who diſcovered the uſe of Oak Sawduſt in the Tanning of Leather, (of which full trial was made, and the efficacy thereof aſcertained, as appears by the ſamples in the Society's repoſitory) threw new lights on that very extenſive and uſeful manufacture, and the improvements made in conſequence thereof, will probably, in time, be practiſed to great advantage, when the legiſlature ſhall think proper to repeal that law which confines the tanner to the uſe of very few materials in his buſineſs.

DYING or COLOURING LEATHER.

The introduction of the eaſtern manner of dying Red and Yellow Leather has been attended

attended with great advantages to the publick; a manufacture of conſiderable extent being now eſtabliſhed in England, where theſe kinds of leather are prepared and dyed in a manner ſuperior to what are imported from Liſbon or elſewhere, and of which large quantities have been exported to foreign markets.

DYING TURKEY RED.

The art of dying this colour on cotton, was formerly unknown in theſe kingdoms; but by the attention of manufacturers to the premiums offered for the diſcovery of it, it can now be done here of as beautiful and as laſting a colour as that imported from the Levant.

SAL AMMONIAC.

The making of this Salt in England has ſucceeded ſo far, that very large works of it are now carried on; to the attainment of which, there is good reaſon to believe, the premiums offered, and the

bounties given, by the Society, have in a great meaſure contributed. And if it be conſidered, that great quantities of this material are conſumed in various operations, the whole of which was formerly imported, its attainment will be found to be an object of great conſequence.

VARNISH.

The beauty and durability of the Varniſh invented and uſed by Monſ. Martin, of Paris, and for which large ſums of money were annually ſent out of theſe kingdoms, induced the Society to offer premiums for diſcovering the method of making the like here; and the high perfection to which our workmen are now arrived in that art, evinces that thoſe premiums have had a happy effect.

VERDIGRIS.

This article, of great uſe to Dyers, and ſome other Manufacturers, was formerly wholly imported from France, at a very great

great expenſe; but the Society having reaſon to believe that Verdigris might be made in England, at a reaſonable price, ſeveral premiums were paid for attempts to obtain it; and of late years a work has been eſtabliſhed, where it is manufactured in very conſiderable quantities; but as an ingenious perſon at Mancheſter has diſcovered a method of preparing a cheap ſubſtitute, which on repeated trials has been found fully to anſwer the purpoſes for which Verdigris is uſed in dying, a reward was given to him for diſcloſing the ſecret, and the whole proceſs, drawn up by himſelf, is annexed to the article of Chemiſtry, publiſhed in this volume.

A SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

COLONIES and TRADE.

	Pecuniary £.	s.	d.	Honorary Medals. Gold	Silv.
For eſtabliſhing a Botanick Garden, and for obſervations applied to uſe in Georgia.				2	
For importing Earth Nuts, Myrtle Wax, Sturgeon, and Zebra Wood.	175			5	
For making Indigo, Iron, and Salt-petre.	50			3	
For planting Vines and Mulberry Trees, and producing Silk and Cotton.	1665	18	2	3	
For eſtabliſhing manufactures of Pot Aſh and Pearl Aſh.	894	15	6	1	
	2785	13	8	14	

OBSERVA-

OBSERVATIONS

ON THE EFFECTS OF

REWARDS beſtowed in the CLASS of

COLONIES and TRADE.

THE Society, influenced by the tenor and ſpirit of ſundry acts of parliament, ſubſiſting for more than a century paſt, and being of opinion, that to encourage in the Britiſh Colonies the culture and produce of ſuch commodities as we muſt otherwiſe import from foreign nations, would be more advantageous to the navigation and commerce of this kingdom, than if the like things could be raiſed within the iſland of Great-Britain, have liberally extended their premiums and bounties for ſundry articles ſuited to the climates and circumſtances of the North-American provinces: among which, the Manufactures of Pot-Aſh and Pearl-Aſh happily ſucceeded to their wiſhes, and the

importation of theſe articles from North-America was an eſtabliſhed and important branch of Trade.

The planting of Mulberry Trees, the propagation of Silk Worms, and the produce of Silk, were ſo far advanced, that, in conſequence of the rewards given by the Society, eleven thouſand five hundred and ſeventy-five pounds of Raw Silk were imported from thoſe provinces.

The planting of Vines, and making Wine from Grapes; the improvement in the making of Indigo, and the obtaining oil from Vegetables, the produce of thoſe colonies, have been objects of the Society's attention.

A SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

MANUFACTURES.

	Pecuniary		Honorary Medals	
	£.	s	Gold	Silv.
For improvements in the Manufacture of Leather, in Bleaching, in making Catgut, in making Artificial Flowers, in Weaving Fishing Nets, Tapestry, and Window Blinds.	209	8	1	1
For making Carpets, Chip Hats, Druggets, Cambrick, Lace, Milled Caps, and various kinds of Paper.	685	11		3
For Quilting in the Loom, and spinning several sorts of Yarn.	597			

For

	Pecuniary		Honorary Medals	
	£.	s.	Gold	Silv.
For improving ſeveral Machines uſed in Manufactures, viz. the Comb Pot, Cards for Wool and Cotton, Stocking Frame, Loom, Machines for winding and doubling, and Spinning Wheels.	544	12		
For method of breeding Silk Worms.	21			
	2057	11	1	4

OBSER-

OBSERVATIONS

ON THE EFFECTS OF

REWARDS beſtowed in the CLASS of

MANUFACTURES.

THE great and good effects of rewards beſtowed in this claſs, afford the cleareſt proofs of the advantages which this nation has derived from the benevolent labours of the Society.

Genius, though not confined to any particular rank, often ſleeps with the affluent, while neceſſity compels the indigent to exert it.

That noble enthuſiaſm, which always exiſts in the authors and inventors of agreeable and uſeful arts, is eaſily excited by well-timed, though moderate, rewards: and, therefore, that there ſhould be a bank of generoſity, to which ſuch genius may, without difficulty, apply, and from whom, with

with certainty, it may expect the reward of merit, as well as a mark of honour, is here undeniably proved to be the ſureſt means of employing and applying ſuch genius to national benefit.

It is not our intention to inſinuate, that the rewards given by the Society has been, in any degree, equal to the national advantages obtained by them: we mean only to ſhew what great benefits have been, and may be, derived from ſmall means well adminiſtered.

CARPETS,

Manufactured in the TURKISH Manner.

This was an early object of attention in the Society; by their rewards it is now eſtabliſhed in different parts of the kingdom, and brought to a degree of elegance and beauty, which the Turkey Carpets never attained.

CAMEOS and INTAGLIOS in artificial Gems.

In conſequence of premiums offered in the claſs of polite arts, for introducing and improving the art of imitating ancient ſculptured Gems, Cameo and Intaglio, by exact impreſſions, in various coloured paſtes, a Manufacture of this kind is eſtabliſhed in England, and ſucceeds ſo well, that all ſorts of engraved or emboſſed Gems, ancient or modern, can be exactly copied, and at ſo ſmall an expence, that whatever there may be of taſte and elegance in theſe epitomized compoſitions of the ancients, they are now no longer confined to the cabinets of the curious, but for the benefit of young artiſts, and the gratification of all others, are diffuſed among the publick.

CHIP HATS.

Being of very general and popular uſe among the female part of the nation, are conſequently,

conſequently, while they continue to be imported from abroad, an important article in the national outgoings; but now they are brought to ſuch perfection in the Manufactories ſet up in Devonſhire and other parts, as to give hopes that the importation will ſoon ceaſe.

COMB POT.

It is of the greateſt importance, that every branch of the woollen manufactory, eſteemed the Staple Trade of the kingdom, ſhould be carried on at the ſmalleſt expence.

The Combers of Wool generally heat their Combs by Charcoal, which, in parts where wood is ſcarce, is immoderately dear. The inventor of a Comb Pot, whereby the ſame operation is effectually performed by Pit-Coal, was judged to be well worthy of being diſtinguiſhed and rewarded by a bounty.

DRUGGETS.

DRUGGETS.

The Society having been informed, by merchants, that a particular ſpecies of foreign Druggets were in great requeſt in the ſouthern markets of Europe, eſtabliſhed and continued annual premiums, till our manufacturers made the like ſort in perfection equal to the foreign.

LEATHER.

Hides being a native commodity, the converting them into Leather was attended to by the Society as another Staple Manufacture. In conſequence of their rewards, Loſh, or Buff-Leather, has been made in England, equal to the beſt imported.

Alſo, a very extenſive manufacture of Red-Leather, in imitation of Turkey or Liſbon, has been eſtabliſhed under the influence of their rewards: great improvements having been made in the proceſs laid before the Society by the foreigner from

from whom they purchaſed the ſecret (ſee the article in claſs Chemiſtry). The ſkins are now prepared and dyed in ſo excellent a manner, that they are not only preferred to the foreign by the conſumers of that commodity at home, but have been exported in conſiderable quantities.

SPINNING, WEAVING, &c.

Great and repeated improvements have been produced to the Society, in Spinning-Wheels, and Machines for winding, doubling, and twiſting Linen, Cotton, and Worſted Yarn; and alſo a very extraordinary improvement in the Loom itſelf: the general intention in all theſe Machines, being to ſhorten labour, and to ſave expence; the Machines themſelves, or perfect models of them, are preſerved in the Society's repoſitory.

It is no improbable conjecture, that the great improvements in Spinning, which have taken place within twenty years, in

theſe kingdoms, particularly in the Cotton works in Lancaſhire, Derbyſhire, Nottinghamſhire, &c. are to be aſſigned to the premiums offered and paid by this Society.

In the year 1760, premiums were firſt offered for "the beſt invention of a machine for ſpinning ſix threads of Wool, Cotton, Flax, or Silk, at one time, and that will require but one perſon to work and attend it;" and in 1764, ſome premiums were paid for attempts at obtaining that deſirable object. At the time therefore of the firſt offering rewards on this ſubject, there ſeems reaſon to believe the thought had not occurred to the manufacturers in general; for from the beſt information hitherto obtained, it appears, that about the year 1764, a poor man, of the name of Hargreaves, employed in the Cotton manufactory, near Blackburn, in Lancaſhire, firſt made one in that county, which ſpun eleven threads; and that in the year 1770, he obtained a patent for

the invention. The conſtruction of this kind of Machine, called *a Spinning Jenny*, has ſince been much improved, and is now at ſo high a degree of perfection, that one woman is thereby enabled, with eaſe, to ſpin an hundred Threads of Cotton at a time: nor did the ſpirit and ingenuity of the manufacturers in this extenſive branch ſtop here, for ſince that period thoſe ſtupendous works, the Cotton Mills at Crumford, in Derbyſhire, and ſeveral other places, have been erected; where by the motion of a large Water-wheel, the Cotton is carded, roved, and ſpun into threads, infinitely more expeditiouſly, and with greater truth, than can poſſibly be done by hand, and better adapted to the general purpoſes of the manufacturers.

Of how great advantage theſe contrivances have been to the trade of Mancheſter, and the country many miles round it, and, by laying the foundation of a very extended commerce, to the kingdom in general,

neral, is ſo well known, as to render a further detail unneceſſary.

PAPER.

1. Of Silk Rags. 2. For Copper-Plate Printers. 3. Emboſſed. 4. Marbled.

Under the encouragement of the Society, all theſe have been eſtabliſhed or promoted; the firſt from the difficulty of diſchaging the colours from dyed ſilk, has not been yet made perfectly white; but is manufactured in ſmall quantities of different ſhades of brown, or other colours, and is the beſt paper for drawing on with chalks, or crayons: the ſecond was neceſſarily imported, at a conſiderable expence, from France, till its manufacture at home was promoted by the Society: the third and fourth ſorts were alſo foreign manufactures; and the laſt, being of very general uſe, was imported in great quantities, and to a great amount in value; but it is now made here to perfection, at ſeveral manu-

factories, and is become an article of exportation.

QUILTING in the LOOM.

When the propoſition was firſt made in the Society, of offering a premium to encourage the making in the Loom, an imitation of that ſpecies of Needle-work, long known by the name of Marſeilles Quilting, it was almoſt rejected as viſionary and impoſſible; but the laudable ſpirit of enterprize, which has always diſtinguiſhed this Society, determined them to publiſh the premium, and the conſequence has juſtified the meaſure. This ſucceſs animated them to continue their premiums, in hopes of further improvement, in which they were not diſappointed. The manufacture is now ſo thoroughly eſtabliſhed, and ſo extenſive, being wrought in all the different materials of Linen, Woollen, Cotton, and Silk, that there are few perſons of any rank, condition,

or ſex, in the kingdom, (and we may add, within the extent of Britiſh commerce, ſo greatly is it exported) who do not uſe it in ſome part of their clothing; ſo that we may ſafely ſay, if the whole fund and revenue of the Society had been given to obtain this one article of Trade, the national gain in return ſhould be conſidered as very cheaply purchaſed.

A SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

MECHANICKS.

	Pecuniary		Honorary Medals	
	£.	s.	Gold	Silv.
For improvements in different kinds of Carriages; for a Coach brace, and for a variety of Machines and Models.	807	1	2	4
For an Auger, Gauging Rod, Index Ballance, Quadrant, Hydrometer, Locks, Hinges, Wimble and Jack for Ship-Builders.	168	10	1	3
For Mills, viz. Hand Mills, Saw Mills, Tide Mills, &c. Pumps, Chime Clock, Time Piece, Ships Blocks, Valve Water Cock, Cranks and Packing Preſſes.	807	15	1	1

For

	Pecuniary			Honorary Medals	
	£.	s.	d.	Gold	Silv.
For a Model of an Arch, Cranes, Engine for poliſhing Plate Glaſs, Gun Harpoons, utility of Gun Harpoons, Ploughs, Pulleys, Silk Reel, Springs, Tablets, Spinning Wheels, Umbrella, Compaſs, Diving Bell, Floating Light, Irons for Wire-Drawing, and Portable Oven.	61	7	8 6	4	5
For diſcovering an univerſal Standard of Weights and Meaſures, account of the Archimedean Screw, and a method of Meaſuring Diſtances, &c.	52	10			1
For the method of floating Veſſels ſtranded on a lee ſhore, exemplified by a model of the York Eaſt-Indiaman, in the Society's Repoſitory.				1	
	245	3	4 6	9	14

OBSERVATIONS

ON THE EFFECTS OF

REWARDS beſtowed in the CLASS of

MECHANICKS.

ONE great and general effect of the rewards given in this claſs, has been the removing, in many inſtances, old vulgar prejudices againſt all new inventions. The moſt ignorant are generally the moſt obſtinately attached to the ways of working wherein they have been brought up. The huſbandmen of Surry, Berkſhire, and ſundry other parts, can ſcarcely be prevailed upon, at this day, to uſe the Norfolk and Suffolk Plough in ſimilar ſoils, though it operates at half the expenſe of their own. But the many valuable Machines and Models, the Mechanical Inventions or Improvements produced in near thirty years (and every year increaſing) being preſerved in the Society's repoſitory,

for

for the inſpection and information of the publick, and the ſeveral convincing experiments made under the auſpices of the Society, have begun, by means of its members and other gentlemen, to excite and diffuſe a ſpirit of improvement, particularly in inſtruments of huſbandry, through all parts of the kingdom.

SAW-MILLS.

Intimidated by a groundleſs ſuggeſtion of a pretended prohibitory act of parliament, this country ſubmitted, for many years, to have Timber cut into Boards by the Saw-Mills of Holland and other Foreign Countries, till the publick ſpirit and the rewards of the Society interpoſing, the prejudice was overcome; and to the great credit and emolument, both of the publick, and of the particular undertakers, Saw-Mills are now firmly eſtabliſhed in England.

WHALE-FISHERY.

The invention of the method of Striking Whales by the Gun-Harpoon, now confirmed by experience, will, moſt probably, make the profits of that Fiſhery much more conſiderable than they were before.

PLANING CAST-IRON—POLISHING PLATE-GLASS.

The Machine for Planing Caſt-Iron Plates: and alſo the Engine or Mill for Poliſhing Plate-Glaſs, by horſe, wind, or water, are inventions of very great merit. But it ſuits not the intended brevity of theſe obſervations, to deſcribe the ſeveral excellent Machines in poſſeſſion of the Society, which will be beſt underſtood by viewing them in the Repoſitory.

WEIGHTS and MEASURES.

The diſcovery of an univerſal Standard of Weights and Meaſures, has long been wiſhed

wiſhed for by the learned in every part of Europe, and the Society, in hopes of obtaining ſo deſirable an object, offered conſiderable premiums, which extended to perſons reſiding in any country whatever. To the honour of this nation, a mode has been found of lengthening and ſhortening a pendulum by ſo eaſy a method, and with ſuch degree of accuracy, as to ſolve the problem in a manner nearer truth than had ever been done before, and renders it probable, that with ſome improvements, it may become perfect; but as an abſtract of the paper, to which a part of the premium was adjudged, is annexed to this article, and a Model of the Machine remains in the Society's Repoſitory, it is unneceſſary to be more particular on this ſubject.

A SUMMARY

A SUMMARY ABSTRACT

Of the REWARDS given in the CLASS of

POLITE ARTS.

	Pecuniary		Honorary Medals.		Pallets		
	£.	s.	Gold	Silv.	Gold	Silver Great	Silver Small
For Baſſo Relievos, Caſting in Bronze, Carvings in Wood, Statues in Marble, Cameos, Paſtes, and Profile of his Majeſty.	1547	3			1		
For Charts, Maps, Surveys and Plans.	356	10	1	1			
For Drawings, Etchings, Engravings, and Mezzotintos.	3591	19	22	25	20	64	52
For Painting, viz. Hiſtory Painting Landſcape Painting, and Sea Pieces, and for Modelling.	3015	18			2	3	

For

	Pecuniary		Honorary Medals		Pallets		
			Gold	Silv.	Gold	Silver	
	£.	s.				Great	Small
For improvements in Crayons, Water-Colours, Ink, Staining Marble, Machine for teaching blind perſons Arithmetick, Needle-Work, and Penmanſhip.	84					1	1
	£ 8595	10	23	26	23	68	53

OBSER-

OBSERVATIONS

On the Effects of Rewards beſtowed in the CLASS OF POLITE ARTS.

HOWEVER conſiderable the ſums that have been expended by the Society in the advancement of the Polite Arts, the remarkable ſucceſs with which they have been attended, may now be contemplated with particular ſatisfaction. It ſoon became evident, from the number of candidates for premiums in the ſeveral branches of this claſs, that genius wanted only encouragement, to ſhine with equal luſtre in this as in other countries; and it appears, that the rewards ſo liberally diſtributed by the Society, have been the means of bringing forward a number of ingenious artiſts, and inciting individuals to ſuch an exertion of their talents, as to become

become an honour to the Society, and to their country.

The reputation acquired by ſeveral candidates, in conſequence of their performances remaining for ſome time under the inſpection and examination of the members of the Society, before and after adjudication, occaſioned the artiſts in general to apply for an exhibition of their works, in the Society's great room, which was accordingly complied with, and repeated annually for ſome years at the charge of the Society.

Hence aroſe the annual exhibitions of the rival artiſts, who formed themſelves into ſeparate bodies. The emulation by which each was excited, helped greatly to promote the rapid improvement of the arts; and to attract the general attention of the publick towards their performances. And hence, alſo, the royal patronage and protection they have ſince had the honour of obtaining, and under which they

ſo

ſo eminently and deſervedly flouriſh, may in ſome meaſure be derived.

The Society having been thus fortunately ſucceſsful in rearing the infant arts in this kingdom, to ſuch maturity, as qualified them for royal favour, have for ſome years paſt confined their premiums chiefly to the encouragement of thoſe youths who may intend to be profeſſors of the arts; but ſtill to diffuſe an elegant taſte among thoſe in a higher ſphere of life, honorary premiums are annually beſtowed on young perſons of rank and eminence, who may probably become hereafter the patrons or patroneſſes of the fine arts: and it is with the higheſt degree of ſatisfaction the Society obſerve the accuracy and beauty of the productions which are offered in claim of thoſe premiums.

Encouragement has alſo been given to thoſe branches of the Polite Arts, which more immediately tend to improving the Manufactures, and conſequently promoting

ing the commerce of the country, ſuch as Silk Weavers, Callico Printers, &c. &c. and the elegance of pattern adopted by them, and which renders their Manufactures equal in beauty to thoſe of any other country, may, with juſtice be attributed, in a great degree, to the rewards and attention beſtowed on them by the Society.

MISCELLANEOUS ARTICLES,

Not arrangeable in the foregoing Claſſes.

Date	Article	To whom adjudged	Pecuniary	Honorary Medals Gold	Silv.
			£. s. d.		
1756	For a Plan for the management of a Pariſh Workhouſe	Mr. William Bailey	50		
1758	For eminent ſervices	Jacob Lord Viſcount Folkſtone, Preſident		1	
	For eminent ſervices	Robert Lord Romney Vice-Preſident		1	

For

Date	Article	To whom adjudged	Pecuniary	Honorary Medals Gold	Silv.
			£. s. d.		
1758	For his publick ſpirit, which gave riſe to the Society	Mr. William Shipley		1	
	For deſigning the Honorary Medal of the Society	Mr. James Stuart		1	
1761	For procuring Fiſh by Land Carriage	John Blake, Eſq.	3500		
1763	For procuring Fiſh by Land Carriage	John Blake, Eſq.		1	
1767	For eminent ſervices	Edward Hooper, Eſq Vice-Preſident		1	

For

Date	Article	To whom adjudged	Pecuniary	Honorary Medals Gold	Silv.
1767	For an Eſſay on Pot Aſhes	Dr. William Lewis		1	
	For an Eſſay on Pot Aſhes	Robert Doſſie, Eſq.		1	
1768	For eminent ſervices	George Eckerſal, Eſq.		1	
1769	For a liſt and deſcription of Machines	Mr. William Bailey	52 10		
1770	For eminent ſervices	Sir Charles Whitworth, Knight		1	
	For eminent ſervices	Will. Fitzherbert, Eſ.		1	
	For many and great ſervices	Matthew Duane, Eſq.		1	

For

Date	Article	To whom adjudged	Pecuniary	Honorary Medals Gold	Honorary Medals Silv.
1770	For repeated ſervices	Rodolph Valtravers, Eſq.		1	
	For exhibiting Models of Machines of his invention, and in conſideration of his expences in attending the Society	Mr. Gregſon	10 10		
1772 to 1773	Advanced to diminiſh the annual rent of the premiſes occupied by the Society, in the Adelphi	Meſſrs. Adam	2170		
1775	For eſſential ſervices	John Phillips, Eſq.		1	

For

Date	Article	To whom adjudged	Pecuniary	Honorary Medals Gold	Silv.
1775	For promoting the views of the Society	Iſaac Jamineau, Eſq.		1	
	For promoting the views of the Society	Lord Le Deſpencer		1	
1778	For repeated ſervices	Valentine Green, Eſq.		1	
	For preſenting two ſtatues of Mars and Venus.	John Bacon, Eſq.		1	

On

Date	Article	Pecuniary	Honorary Medals Gold	Silv.
	On account of the Paintings in the Great Room of the Society.	£. s. d.		
1777	For Canvas, Colours, and Models	150 19 10		
to	For the Frame, and other incidental expenses attending their fitting up	156 10 4		
1783	Presented to Mr. Barry	50		
		357 10 2		
	From the preceding pages	5783	18	
	Total	6140 10 2	18	

OBSERVATIONS

ON THE

MISCELLANEOUS ARTICLES.

BESIDES the premiums and bounties diſtributed on account of the ſeveral articles ranged under the foregoing claſſes, the approbation of particular ſervices rendered to the Society, has likewiſe been occaſionally teſtified by the grateful acknowledgment of an honorary gold medal; and in ſome ſignal inſtances, where no return in their power could be deemed adequate to the obligation conferred, the Society have endeavoured to ſtamp a yet more ſpecifick value, by the addition of ſome expreſs teſtimonial engraved accordingly on the medal, and have alſo occaſionally thought proper to extend their encouragement, in behalf of the publick, to ſome particular objects, not altogether, perhaps,

ſo

ſo ſtrictly within the ordinary preſcribed limits of their original deſign.

That which may be accounted the chief deviation from their general plan, was the very large ſum given for an endeavour to eſtabliſh an effectual method of procuring a conſtant ſupply of Fiſh, from ſeveral of our diſtant coaſts to the capital, by land-carriage; in which they had the concurrence of the legiſlature, who not only granted a ſum of two thouſand pounds for the ſame purpoſe, but alſo paſſed an act, by which the legal obſtructions to the execution then ſubſiſting were entirely removed. This plan, though it has not in every degree anſwered the ſanguine expectations of the Society, and the publick, yet muſt be univerſally allowed to have been productive of great good, not only to the cities of London and Weſtminſter, but to the country in general; fiſh, ſince the eſtabliſhment of the Land Carriage Plan, being brought by that mode of conveyance in great abundance and variety to the

metropolis,

metropolis, and to moſt of the capital towns in the kingdom, and the inhabitants thereby furniſhed with a delicious and wholeſome food, they were formerly in a great degree unacquainted with.

Another benefit aroſe to the publick from inſtituting a mode of bringing fiſh to London by Land Carriage, which as it does not at firſt ſight appear connected with that ſcheme, has been generally overlooked in the conſideration of the buſineſs. The benefit here alluded to is the improvement of carriages; as fiſh was very liable to be injured by being brought many miles by land, it became neceſſary to provide, if poſſible, ſome means of conveyance, which ſhould obviate that evil. The Society therefore offered premiums for inventing fit carriages for that purpoſe, and ſome machines were produced, to which the premiums were adjudged; theſe have not only anſwered the intent propoſed, but have ever ſince ſerved as models

dels for carriages, to tranſport glaſs and other things liable to be injured in their conveyance by rough treatment; and this is viſible to every one who compares the light and eaſy vehicles now made uſe of, with thoſe employed for the ſame purpoſes, before the above-mentioned plan took place in London.

When the leaſe of the premiſes held by the Society, oppoſite Beaufort-Buildings in the Strand, was near expiring, it was judged expedient to engage with the Meſſrs. Adam, to erect a proper building in the Adelphi, for the uſe of the Society, and the accommodation of its officers. For this purpoſe, in the year 1771, articles were drawn for a leaſe of the premiſes, for a term of ninety-ſix years, at the annual rent of three hundred and thirty pounds; but on paying into the hands of Meſſrs. Adam, the ſum of one thouſand pounds, it was agreed the rent ſhould be reduced to two hundred and ſeventy

pounds

pounds per annum. In the year 1772, on more mature conſideration, it was thought proper, at the requeſt of Meſſrs. Adam, to pay to them the further ſum of one thouſand one hundred and ſeventy pounds, which being done, they engaged to put the Society in poſſeſſion of the building, to ſupply the premiſes with water, and pay all taxes, parliamentary and parochial, for the net rent of two hundred pounds per annum.

In June 1774, the leaſes having been duly executed, the Society took poſſeſſion of the buildings they now occupy, and the before-mentioned engagements have hitherto been mutually fulfilled.

In the year 1777, a propoſal was made by Mr. Barry, at that time a member of the Royal Academy, and ſince elected profeſſor of painting, to decorate the Great Room of the Society with Paintings, analogous to the views of its inſtitution, which

which propoſal being accepted, that ingenious artiſt has been ever ſince employed in perfecting the ſeveral pieces, that are to compoſe the ſeries of pictures deſigned to ſhew the progreſs of art, from the earlieſt accounts to the preſent æra.

A GENE-

A GENERAL ABSTRACT

Of the REWARDS given by the

SOCIETY,

From the firſt Inſtitution, to the Year 1782, incluſive.

	£.	s.	d.	Medals Gold	Medals Silv.	Pallets Gold	Pallets Silver Great	Pallets Silver Small
Agriculture	3281	8		77	31			
Chemiſtry	1391	10		3	3			
Colonies & Trade	2785	13	8	14				
Manufactures	2057	11		1	4			
Mechanicks	2453	4	6	9	14			
Polite Arts	8595	10		23	26	23	68	53
Miſcellaneous	6140	10	2	18				
				145	78	23	68	53
145 Gold Medals	1065	15						
78 Silver Medals	75	3						
23 Gold Pallets	216	4						
68 Great Silver Pallets	91	16						
53 Small Silver Pallets	58	6						
	28212	11	4					

PREMIUMS

OFFERED BY THE

SOCIETY,

INSTITUTED AT LONDON,

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES, AND COMMERCE,

WITH

ORIGINAL PAPERS,

Communicated to the

SOCIETY.

TO THE

PUBLICK.

ADELPHI BUILDINGS, April 10, 1783.

THE chief objects of the attention of the Society for the encouragements of Arts, Manufactures, and Commerce, in the application of their Rewards, are Ingenuity in the ſeveral branches of the Polite and Liberal Arts, uſeful diſcoveries and improvements in Agriculture, Manufactures, Mechanicks, and Chemiſtry, or the laying open any ſuch to the Publick; and, in general, all ſuch uſeful inventions, diſcoveries, or improvements, (though not mentioned in the Book of Premiums), as may appear to have a tendency to the advantage of trade and commerce; the Society therefore, in purſuance of their plan, propoſe to beſtow the following premiums.

Premiums for Planting and Huſbandry.

1. ACORNS. For ſetting or ſowing the greateſt quantity of land, not leſs than ten acres, with acorns, between the firſt day of October, 1782, and the firſt of January, 1783; and for fencing and preſerving the ſame effectually, in order to raiſe timber; the gold medal.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſet or ſown with acorns, agreeably to the above conditions; the ſilver medal.

CERTIFICATES of the ſetting or ſowing agreeably to the above conditions; and that there are not fewer than one thouſand plants on each acre, to be produced to the Society, on or before the firſt Tueſday in November, 1783.

3, 4. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1784.

5. RAISING

5. RAISING OAKS. To the perſon who ſhall raiſe the greateſt number of oaks, not fewer than five thouſand, either from young plants, or from acorns, in woods, parks, or foreſts, that have long been under timber, and effectually fence and preſerve the ſame, in order to ſecure a ſucceſſion of oak timber in this kingdom; the gold medal.

CERTIFICATES and accounts to be produced on or before the firſt Tueſday in January, 1788.

6. CHESNUTS. For ſetting or ſowing the greateſt quantity of land, not leſs than ſix acres, with Spaniſh Cheſnuts, before the firſt day of May, 1783, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

7. For the ſecond greateſt quantity, not leſs than four acres; the ſilver medal.

8. For the third greateſt quantity, not leſs than two acres; the ſilver medal.

CERTIFICATES of ſetting or ſowing agreeably to the above conditions (and that there are twelve hundred Spaniſh Cheſnut plants at leaſt on each acre) muſt be delivered to the Society on or before the firſt Tueſday in November, 1783.

9, 10, 11. The like premiums will be given for ſetting or ſowing Spaniſh Cheſnuts before the firſt of May, 1784.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1784.

12. ELM. For planting the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1782, and the twenty-fourth of June, 1783, and for the effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

13. For the ſecond greateſt number, not leſs than five thouſand; the ſilver medal.

14. For

14. For the third greateſt number, not leſs than four thouſand; the ſilver medal.

CERTIFICATES of having planted agreeably to the above conditions, and ſpecifying the diſtance of the trees, muſt be delivered to the Society, on or before the firſt Tueſday in November, 1783.

15, 16, 17. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1784.

18. WEYMOUTH PINE. For planting out in the year 1783, at a diſtance not exceeding ſix feet, the greateſt number of Weymouth Pines, not leſs than four thouſand, to be two years old at leaſt when planted out; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

19. For the ſecond greateſt number, not leſs than two thouſand; the ſilver medal.

20. For the third greateſt number, not leſs than one thouſand; the ſilver medal.

CERTIFICATES of ſuch planting muſt be delivered on or before the laſt Tueſday in January, 1784.

21. RED VIRGINIA CEDAR. For planting out from the 24th of June, 1782, to the 24th of June, 1783, at a diſtance not more than four feet, the greateſt number of the Red Virginia Cedar, not fewer than three thouſand, the plants to be between two and four years old when planted out, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

22. For the next greateſt number, not fewer than two thouſand; the ſilver medal.

CERTIFICATES of planting according to the above conditions, to be produced

on

on or before the laſt Tueſday in November, 1783.

23, 24. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in November, 1784.

25. SPRUCE FIR. For planting out in one plantation, in the year 1783, at a diſtance not leſs than three, nor more than ſix feet, the greateſt number of Spruce Firs, not leſs than ten thouſand, to be two years old when planted out, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

26. For the ſecond greateſt number, not leſs than ſix thouſand; the ſilver medal.

27. For the third greateſt number, not leſs than four thouſand; the ſilver medal.

CERTIFICATES to be produced on or before the laſt Tueſday in January, 1784.

28. SILVER FIR. For planting out from the firſt of September, 1782, to the thirty-firſt of March, 1783, at a diſtance not leſs than three, nor more than ſix feet, the greateſt number of Silver Firs, not fewer than four thouſand, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

29. For the ſecond greateſt number, not fewer than three thouſand; the ſilver medal.

30. For the third greateſt number, not fewer than two thouſand; the ſilver medal.

CERTIFICATES to be produced on or before the laſt Tueſday in January, 1784.

31. LARCH. For planting out, from the twenty-fourth of June, 1782, to the twenty-fourth of June, 1783, at a diſtance not more than five feet, the greateſt number of Larch trees, not leſs than five thouſand; the plants to be between

two

two and four years old when planted out, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

32. For the ſecond greateſt number, not leſs than three thouſand; the ſilver medal.

CERTIFICATES of planting according to the above conditions, to be delivered on or before the laſt Tueſday in November, 1783.

33, 34. The like premiums will be given on the ſame conditions, for planting out Larch trees, between the twenty-fourth of June, 1783, and the twenty-fourth of June, 1784.

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1784.

35. UTILITY OF LARCH. To the perſon who ſhall ſend in the moſt ſatiſfactory account, verified by experiments,

of

of the utility of Larch Trees, for the various purpoſes of timber; the gold medal.

The accounts to be produced on or before the ſecond Tueſday in December, 1783.

36. The ſame premium will be given in the year 1784, the accounts to be produced on or before the ſecond Tueſday in December, 1784.

37. NORFOLK WILLOW. For the greateſt number of acres, not leſs than ſix, planted in the year 1782, with Norfolk Willows; the number of cuttings to be at leaſt one thouſand on each acre, properly fenced and ſecured.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1783, of the ſaid planting, and that the trees were then growing on the land; the gold medal.

38. OCCIDENTAL PLANE TREES. For the greateſt quantity of land, not leſs than

than two acres, planted with Occidental Plane Trees, in the year 1783, not leſs than five hundred on each acre, properly fenced and ſecured.

CERTIFICATES to be produced to the Society, on or before the laſt Tueſday in December, 1783, of the ſaid planting, and that the trees were then growing on the land; the gold medal.

39. The ſame premium will be given for Occidental Plane Trees, planted in the year 1784.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1784.

40. ALDER. For the greateſt number of acres, not leſs than ſix, planted in the year 1782, with Alders, to be at leaſt one thouſand on each acre, properly fenced and ſecured.

CERTIFICATES to be produced to the Society, on or before the laſt Tueſday in December,

December, 1783, of the ſaid planting, and that the trees were then growing on the land; the gold medal.

41. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1784.

42. UPLAND OR RED WILLOW. For the greateſt number of acres, not leſs than three, planted before the end of April, 1783, with Upland or Red Willow, properly fenced and ſecured, the number of plants on each acre to be at leaſt twelve hundred; the gold medal.

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1784.

It is well known that this ſpecies of Willow thrives well on dry ſandy land.

43. The ſame premium is extended one year further.

CERTIFI-

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1785.

44. ASH. For planting the greateſt number of acres, not leſs than ſix, in the year 1783, with Aſh for Timber; the plants to be at leaſt two years old, properly ſecured and fenced; the number of plants on each acre to be at leaſt twelve hundred; the gold medal.

45. For the next greateſt number of acres, not leſs than four; the ſilver medal.

CERTIFICATES to be delivered on or before the ſecond Tueſday in March, 1784.

46, 47. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in December, 1785.

48, 49. The ſame premiums are extended one year further.

CERTIFI-

CERTIFICATES to be delivered on or before the ſecond Tueſday in December, 1786.

50. LOMBARDY OR PO POPLAR. For planting in the year 1782, the greateſt number of the Lombardy Poplar, or Po Poplar, properly fenced and ſecured, for raiſing timber; the gold medal.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1783.

The quantity of land to be not leſs than ſix acres, and not fewer than twelve hundred plants on each acre.

N. B. This tree is called by ſome the Pine Poplar.

*** *The Candidates for planting all kinds of Trees, are to certify, that the reſpective plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates.*

Any

Any information which the Candidates for the foregoing premiums may chuſe to communicate, relative to the methods made uſe of in forming the plantations, or promoting the growth of the ſeveral trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.

51. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber, or poles, for uſe when expoſed to the weather, viz.

Larch,	Black Poplar,
Aſh,	Spaniſh Cheſnut,
Willow,	Alder.
Lombardy Poplar,	

The gold medal.

The accounts to be produced on or before the ſecond Tueſday in December, 1783.

52. The

52. The ſame premium is extended one year further.

The accounts to be produced on or before the ſecond Tueſday in December, 1784.

53. PRESERVING ACORNS. To the perſon who ſhall produce to the Society the moſt effectual method of preventing Acorns, when ſown or planted for Timber, being injured by Mice; the gold medal.

The accounts verified by actual experiments, with proper certificates that the methods made uſe of have been fully ſufficient for the purpoſe, to be produced on or before the laſt Tueſday in November, 1784.

54. PRESERVING CHESNUTS, and SEEDS of other FOREST TREES. To the perſon who ſhall produce to the Society, the moſt effectual method of preventing Cheſnuts, and the Seeds of other Foreſt Trees, when ſown or planted for Timber,

Timber, being deſtroyed by Mice; the ſilver medal.

55. PRESERVING GARDEN SEEDS. For the moſt effectual method of preventing Garden Seeds being deſtroyed by birds or vermin, after they are ſown; the ſilver medal.

The accounts verified by actual experiments, with proper certificates that the methods made uſe of have been fully ſufficient for the purpoſe; to be produced on or before the laſt Tueſday in November, 1784.

56, 57, 58. The premiums for preſerving Acorns, Cheſnuts, and Garden Seeds, are extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1785.

59. PLANTING BOGGY OR MORASSY SOILS. For an account of the beſt ſet of experiments ſent by the planter, or his repreſentative, to aſcertain the comparative advantages of planting boggy or moraſſy ſoils, with White Poplar, Black Poplar,

Lombardy Poplar, and Willow; the gold medal.

It is required that not leſs than half an acre be planted with each, and the plants to be not more than four feet aſunder.

It is alſo required that the plantation ſtand fourteen years, at the end of which to be all cut down and meaſured, or accurately meaſured ſtanding; the certificates of the meaſure and value, and that the whole is properly fenced and ſecured, to be produced on or before the firſt Tueſday in January, 1792.

N. B. Any information relative to the ſtate of the plantation, if ſent to the Society, between the times of planting and claiming the premium, will be thankfully received.

60. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1793.

61. The ſame premium is extended one year further.

CERTIFI-

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1794.

62. ROOTS OF CORN. To the perſon who ſhall aſcertain from obſervation, and by experiment, the ſucceſſion of the different Roots of Corn (diſtinguiſhing the times when ſuch ſucceſſion of roots takes place) particularly thoſe which ſhoot out at or near the time the plants go into ear; ſhewing alſo from facts, the injury ariſing from the failure of thoſe particular roots, and the moſt effectual means of preventing ſuch misfortune; the gold medal.

To be produced on or before the firſt Tueſday in January, 1784.

63. The ſame premium is extended one year further. Accounts to be delivered on or before the firſt Tueſday in January, 1785.

N. B. Theſe premiums are extended to Scotland and Ireland.

64. CULTURE OF WHEAT. For the beſt ſet of experiments to aſcertain whether it is moſt advantageous to cultivate Wheat, by ſowing it in the common broad-caſt way, or by drilling it in equi-diſtant rows, hoeing the intervals; the gold medal.

It is deſired that the diſtance between the rows may not exceed eleven inches, and that an account of the nature and condition of the land on which the experiments are made, together with an account of the produce of the corn, be produced to the Society, on or before the firſt Tueſday in February, 1784.

65. The ſame premium is extended one year further. The accounts to be produced to the Society, on or before the firſt Tueſday in February, 1785.

66. BEANS AND WHEAT. To the perſon who ſhall plant or drill in the year 1782, the greateſt quantity of land, not leſs than thirty acres with beans, and ſhall ſow the ſame land with Wheat in the ſame year; the gold medal.

It

It is required that an account of the ſort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the produce per acre threſhed, the application of the ſtraw; the expenſe of planting or drilling, hand or horſe-hoeing, the diſtance of rows and the quality of the ſoil, together with certificates of the number of acres, and that the land was actually ſown with wheat in the year 1782, be produced on or before the firſt Tueſday in November, 1783.

N. B. The Society have been informed that Beans may be drilled or planted ſo early as the month of December, from whence may be derived the advantage of an early harveſt, in which caſe the ſtraw will be far more valuable than that from a later planting or drilling.

67. The ſame premium is extended one year further, the accounts to be delivered on or before the firſt Tueſday in November, 1784.

 68. POTA-

68. POTATOES. To the perſon who ſhall cultivate the greateſt quantity of land with Potatoes for the table, not leſs than fifty acres; the gold medal.

CERTIFICATES of the planting, with accounts of the produce of at leaſt one acre, taken at a medium of the plantation, to be delivered to the Society on or before the laſt Tueſday in January, 1784.

N. B. If there are ſeveral candidates for this premium, a gold medal will be given to each of them, not exceeding five in number, who ſhall ſeverally have planted the greateſt quantities, not leſs than fifty acres.

69. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantages of the drill, or broad-caſt method in the cultivation of Turneps; the gold medal.

The accounts to be delivered in, on or before the third Tueſday in April, 1784.

70. The

70. The ſame premium is extended one year further; the accounts to be delivered on or before the third Tueſday in April, 1785.

71. GREEN VEGETABLE FOOD. For the beſt account confirmed by experiments, of the vegetable food, (cabbages and turneps excepted) growing in the months of March and April, that will moſt encreaſe the milk in mares, cows, and ewes at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the gold medal.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1783.

72. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1784.

73. MIXTURE OF GRASS SEEDS. For the beſt ſet of experiments to aſcertain the moſt advantageous mixture of different ſeeds for laying down arable land to graſs, on wet or ſtrong ſoils; the gold medal.

It is required that the experiments be comparative, and continued three years; that not leſs than three different mixtures be tried, nor leſs than one acre be applied to each; and that the ſeeds uſed be ſeparate, not the produce of common meadows.

An account of the ſoil, preparation, crops of corn, (if any) ſeeds uſed, and the produce of the new graſs, whether fed or mown, to be delivered on or before the firſt Tueſday in January, 1784.

74. The ſame premium will be given on the like conditions for aſcertaining the moſt advantageous mixture of different ſeeds for laying down arable land to graſs, on dry or light ſoils.

75. TURNEP-

75. TURNEP-ROOTED CABBAGE. For raiſing, and having duly cultivated Turnep-rooted Cabbage, in the year 1782, for the feeding cattle or ſheep, on the greateſt number of acres, not leſs than ten, and giving an account of the ſoil, culture, time, and manner of feeding off, produce, and the effects on cattle or ſheep fed with it; the gold medal.

76. For the next greateſt number of acres, not leſs than five; the ſilver medal.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1783.

77. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP AND BLACK CATTLE. For the moſt ſatisfactory experiments made in the year 1781, in order to aſcertain which of the following plants can be cultivated and houſed, or otherwiſe ſecured for winter fodder, to the greateſt advantage, viz.

Turnep-

Turnep-rooted Cabbage,	Carrots,
Turnep Cabbage,	Parſneps,
Turneps,	Potatoes.

The accounts to be produced on or before the firſt of November, 1783; the gold medal.

It is required that the above roots be taken off the land by the laſt day of October, 1781; that a crop of wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſervation, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiment muſt be made between two or more of any of the above-mentioned plants, and not leſs than two acres be cultivated with each particular kind of plant.

N. B. Great advantage will ariſe to the farmer occupying land, in the neighbourhood of extenſive commons, from the conveniency of keeping large flocks of ſheep, and herds of cattle, if the difficulty of ſupporting

porting them through the winter was obviated by a due knowledge of this practice.

78. TURNEP ROOTED CABBAGE. To the perſon who ſhall raiſe in the year 1782, the greateſt quantity, per acre, of Turnep-rooted Cabbage, on not leſs than one acre; the gold medal.

CERTIFICATES of the number of acres, and produce by weight, free from leaves and dirt, and before houſing, with an account of the ſoil, preparation, and culture, to be produced on or before the firſt Tueſday in November, 1783.

79. The ſame premium is extended one year further; the quantity of land to be at leaſt four acres.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1784.

80. REARING AND FATTENING HOGS. For the beſt account of the moſt profitable

profitable method of rearing and fattening hogs, verified by experiments, including and account of the weight, and kind of food uſed, and of the weight of the hogs, both before and after fattening; to be delivered to the Society on or before the firſt Tueſday in March, 1784. The gold medal.

N. B. Should any perſon have already made obſervations relative either to the manner of rearing or fattening hogs, yet ſhould not be able to comply with the terms ſpecified in the above premium, the Society will be happy to receive from him any information which his experience may have furniſhed him with on the ſubject.

81. MANAGING BEES. To the perſon who ſhall produce to the Society the moſt ſatisfactory account verified by experiments, of managing Bees to the greateſt advantage in this climate; the gold medal.

To be produced on or before the ſecond Tueſday in January, 1784.

82. CULTI-

82. CULTIVATING THE TRUE RHUBARB. For raiſing, before the end of the year 1783, the greateſt number of plants, not leſs than three hundred, of Rheum Palmatum, or true Rhubarb; the gold medal.

83. For the next greateſt quantity, not leſs than two hundred plants; the ſilver medal.

CERTIFICATES of the number of plants, that they ſtand at leaſt ſix feet aſunder, that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect, to be produced on or before the ſecond Tueſday in February, 1784.

84, 85. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in February, 1785.

86. RHUBARB.

86. RHUBARB. For the greateſt quantity of Rhubarb of Britiſh growth, not leſs than twenty pounds weight, equal to ſuch as is commonly ſold in the ſhops, under the name of Turkey or Ruſſia Rhubarb; five pounds of which to be produced as a ſample, with certificates that the remainder is of equal goodneſs; and a particular account of the manner of culture, and cure, on or before the firſt Tueſday in November, 1783; the gold medal.

87. For the next greateſt quantity, not leſs than ten pounds weight, the ſilver medal.

88, 89. The ſame premiums are extended one year further. The ſamples and certificates to be produced on or before the firſt Tueſday in November, 1784.

90. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due

proportion

proportion of the ſeveral component parts of Arable Land, in one or more counties in Great-Britain, by an accurate analyſis of it, and who having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the deficiencies in the poor ſoil, improve a quantity of it, not leſs than two acres, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the gold medal.

It is required that the manurings, plowings, and crops of the improved land, be the ſame after the improvement as before, and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper certificates, and the chemical reſults of the analyſes, which are to remain

the

the property of the Society, on or before the laſt Tueſday in November, 1788.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced with the certificates.

N. B. Among the methods or proceſſes made uſe of by Chemiſts, and called *dry*, or *moiſt*, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of arable earth.—Dr. Shaw, in his Chemical Lectures.—Dr. Home in his principles of Agriculture.—Dr. George Fordyce, in his Elements of Agriculture, and Sir Torbern Bergman, in his *Diſſertation ſur les Terres geoponiques*, have treated of theſe ſubjects.

91. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1789.

92. The

92. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1790.

93. IMPROVING LAND LYING WASTE. For the beſt account of a method for improving any of the following ſoils, being land lying waſte or uncultivated, viz. Clay, Gravel, Sand, Chalk, Moor, or Peat-earth, and Bog; verified by experiments on not leſs than ten acres of land, to be produced on or before the ſecond Tueſday in December, 1783, the gold medal for each.

94. For the next in merit, the ſilver medal.

The ſoil, manner of improvement, expenſe, and product are required to be fully explained.

95, 96. The ſame premiums are extended one year further.

The accounts to be produced on or before the ſecond Tueſday in December, 1784.

97. MANURES. To the perſon who ſhall give the moſt ſatisfactory account, verified by accurate experiments, on what ſoil the application of Marle, Chalk, Lime, or Clay, ſeverally, as manures, be moſt beneficial; the gold medal.

It is required that each experiment be made on one acre, and that they be continued four years, the ſame crop being ſown the ſame year on the ſeveral ſpots.

It is alſo required, that if different manures are compared, the experiments be made on ſimilar ſoils, lying near each other.

An account of the nature of the ſoil, manure, and the quantity laid on, with all expenſes and crops, to be delivered, with ſpecimens of the ſoil and manure, on

or

or before the firſt Tueſday in January, 1784.

98. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January, 1785.

99. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January, 1786.

100. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantage of the following manures, uſed as Top-Dreſſings, viz. Soot, Coal-Aſhes, Wood-Aſhes, Lime, Night-Soil; the gold medal.

It is required that not leſs than half an acre of land be appropriated to each manure, the ſoils ſimilar, and lying near each

other, and that the ſame crops be ſown in the ſame year on each ſpot; the experiments to be continued not leſs than two years.

An account of the nature of the ſoil, quantity, and expenſe of the manure and crops, with certificates, to be produced on or before the firſt Tueſday in December, 1784.

101. ROLLING OR SCARIFYING GRASS LAND. To the perſon who ſhall, by experiment, determine whether it is moſt beneficial to Graſs Land, to roll it with a heavy roller, or to cut the ſurface two or more inches deep at ſmall intervals, with an inſtrument commonly called a Scarificator (which is ſimilar to a harrow compoſed of coulters inſtead of tines); a buſh harrow and light roller being afterwards drawn over the part of the field thus ſcarified; the gold medal.

It is required that the above experiment be made on natural graſs, whether old or new,

new, meadow or upland, provided the ſame has been laid down at leaſt three years, and that the experiment be continued for four years at leaſt. An account of the nature of the ſoil, weight of the roller, deſcription of the ſcarificator, depth to which it cuts, and the comparative ſucceſs of each method, to be delivered on or before the firſt Tueſday in November, 1783.

102. TO ASCERTAIN THE PROPER DEPTH OF PLOUGHING. To the perſon who ſhall give the moſt ſatisfactory account, verified by accurate experiments, in order to determine the moſt proper depth of Ploughing, on clay or ſtrong land; the gold medal or fifty guineas.

It is required that all experiments be made on ſimilar ſoils lying near each other, that each experiment ſhall conſiſt of two acres at leaſt, that the deepeſt ploughing be at leaſt four inches deeper than the re-

puted ſtaple of the land, or uſual depth of ploughing, and that theſe experiments be continued during a courſe of ſix years, the ſame crops being ſown the ſame year on the ſeveral ſpots. An account of the nature of the ſoil, different depths of ploughing, quantity of manure, (if any) laid on each ſpot, all expenſes and crops; to be delivered on or before the firſt Tueſday in January, 1784.

N. B. If the above experiments are made on land, which has little or no fall, it is then required that the land be hollow drained, at leaſt twelve inches deeper than the deepeſt ploughing.

103. ASCERTAINING THE BEST COURSE OF CROPS ON CLAY SOIL. To the perſon who ſhall give the moſt ſatisfactory account, verified by comparative experiments, in order to aſcertain the courſe of Crops, which with or without a fallow, ſhall, during the ſpace of eight years, prove moſt profitable, and

ſhall

ſhall leave the land in the beſt ſtate, on a Clay Soil; the gold medal, or fifty pounds.

It is required that ſuch comparative experiments be made on three acres at leaſt in each mode; the ſoil to be as contiguous and ſimilar as poſſible. An account of the ſoil, management, and crops, to be delivered on or before the firſt Tueſday in January, 1786.

104. COURSE OF CROPS ON STRONG LAND. For the moſt ſatisfactory account, verified by experiments, made on not leſs than five acres of Clay, or wet Loom, to aſcertain the advantages of the following courſe of crops, viz. Firſt, Beans drilled, or planted and hoed; Secondly, Wheat; the gold medal.

Theſe experiments to be continued two courſes, or four years.

CERTIFICATES, with an account of the ſoil, culture, and quantity of manure

(if any) laid on, to be produced on or before the laſt Tueſday in March, 1784.

N. B. The ſucceſs of this courſe of crops, much depending on the land being kept entirely clean, it is expected that each crop of the Beans be horſe-hoed or hand-hoed, at leaſt three times.

105. The gold medal or twenty pounds will be given on the ſame conditions in the year 1788.

CERTIFICATES to be produced on or before the laſt Tueſday in March, 1788.

106. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor Land, not leſs than one hundred; the gold medal.

It is required, that the land before improvement be abſolutely uncultivated, in a great meaſure uſeleſs, not let to any tenant, and without any building upon it, except cottages or huts. That in its improved ſtate it ſhall be encloſed, cultivat-

ed

ed, and divided into fields, with buildings erected thereon ſufficient for the uſe and reſidence of a tenant.

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved; of the mode and expenſe of the improvement; the ſtate it is in as to the proportion of graſs to arable; the rent at which it is let; to be produced on or before the firſt Tueſday in February, 1784.

The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1785.

107. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1786.

108. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the Society an account of the beſt method,

thod, verified by actual experiment, of Land gained from the Sea, not leſs than twenty acres, on the coaſt of England or Wales; the gold medal.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1780, to be produced to the Society on or before the firſt Tueſday in October, 1785.

N. B. The Society have been credibly informed, that Land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other.

109. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1786.

110. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1787.

111. DRILL

111. DRILL PLOUGH FOR HORSE BEANS. For the beſt Drill Plough for Horſe Beans only; being an improvement on thoſe already in the poſſeſſion of the Society, or generally known; to be produced to the Society, on or before the firſt Tueſday in January, 1784; the ſilver medal, or ten guineas.

It is expected the plough be ſtrong and cheap, no variation of depth or diſtance being required.

The plough to which the premium is adjudged, is to become the property of the Society.

112. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly, and cheaper, than by any method now practiſed, provided it does not ſhed the Corn or Pulſe, more than the methods

thods in common practice, and that it lays the ſtraw in ſuch manner as may be eaſily gathered up for binding; the gold medal.

The Machine, with Certificates that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1783.

Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

113. SCAB IN SHEEP. To the perſon who ſhall diſcover to the Society the moſt efficacious method of curing the diſorder called the *Scab in Sheep*, verified by repeated trials; the ſilver medal, or ten guineas.

CERTIFICATES of the cure, with an account and deſcription of the diſeaſe, to be delivered to the Society on or before the ſecond Tueſday in January, 1784.

The

The following is an account, containing the method made use of in, and the success attending, Mr. David Day's Plantation of Ash, for which he received a premium of twenty pounds, in the year 1779.

It may be proper to note, that although this candidate chose to accept the pecuniary premium of twenty pounds (in lieu of the silver medal to which he was entitled) yet with so much disinterestedness did he act, that he added a considerable sum of money to it, and purchased a large silver cup, on which was engraven an inscription, declaring the generosity of the Society, and the occasion of his becoming possessed of the piece of plate.

To the Members of the Society, for the Encouragement of Arts, Manufactures, and Commerce.

Gentlemen,

IN the year 1763, I planted two acres of Ash for a Wood, the plants six feet from

from each other, which took up 2400 plants; I dug holes, 15 inches deep to plant them in; I neglected them, and they got the better of me ſo much that I did not till them. I ſtill thought planting was worth notice; in 1769, I planted 1 acre, 3-qrs. 8 roods, 4 feet diſtant from each other, which took 4845 plants; I was careful in tilling them, from which I found great advantage, as they were likely to produce three times the money the above two acres would; I ſtill thought there was a better method. In 1771, I bedded 14 buſhels of keys; in 1772, I put them in a nurſery, ſomething more than 3-qrs. of an acre. In 1773, I was determined to go on in a capital manner; I bedded 50 buſhel of Aſh Keys; in 1774, I planted 5 acres, 21 rood, four feet one way, and two feet the other, which required 27914 plants. I took care to keep them very clean; ſmall holes were dug for the plants, which I found did as well as large ones. The plants being very luxuriant and tall,

and

and planted by the hundred, at ſix-pence per hundred, were badly put in, and the wind had great power over them. I was obliged to head them the firſt year, which is generally done the ſecond year; they now ſtand very clean, and are allowed by thoſe who have ſeen them, to be as good as can be, and I flatter myſelf they will, when felled, produce the moſt hop-poles, for the firſt fall, of any plantation in England. Theſe are likely to pay much better than the 1 acre, 3-qr. 8 rood. Finding them likely to turn out ſo well, I was encouraged to perſevere. In 1775, I ſet the produce of the aforeſaid 50 buſhel of Aſh Keys, in rows, two feet apart; in 1776, I took up half, as near as I could judge, and put them in a nurſery, two feet apart one way, and four inches in one row, and eight inches in the other. My reaſon for planting one row as thick again as the other, was, the thick row all comes up, but in the thin row only two out of three; I could not have taken them up,

if

if they had been thicker, without injuring the ſtanding plants. This was ſufficient for 5 acres, 33 rood; they were put in with ſmall hand-dibbers, by the thouſand, at only one ſhilling per thouſand; the men earned two ſhillings and ſix-pence per day, and the women one ſhilling and ſix-pence per day by planting them; the 5 acres, 3-qrs. 33 roods, took up 249900 plants. In 1778 I took the other half, which were two years old, (the youngeſt I have planted to ſtand for a wood) and planted 16 acres, 3-qrs. 27 rood, for timber and underwood. I thought the diſtance for planting could not be altered for the better, but the expenſe of putting the plants in the ground might be leſſened: inſtead therefore of digging holes, I put ſix horſes in a plough, and ploughed the land very deep, dreſſed the ground down, and planted with hand-dibbers. Where the plants were too large, as many were ſix feet long, I took a hop-pitcher, and made holes with it, by this method

I can

I can plant one thouſand plants for two ſhillings; whereas my firſt planting coſt me thirty ſhillings per thouſand for labour only: 14 acres, 3-qrs. 13 rood, out of 16 acres, 3-qrs. 27 rood, are planted at the diſtance of four feet by two feet; this took up 80682 plants: 2 acres 14 rood are planted two feet by eight inches, which took up 66400 plants. The reaſon of my planting as thick again one way as the other, is, that in this manner they are ſo much eaſier to till. I have had what we call a brake and a nidget made to draw with a horſe or two, to move the earth in the alleys, and hand hoe in the rows, which I find ſhortens the expenſe greatly, and keeps the ſurface of the earth cleaner than digging, though I dig in the winter, where it is neceſſary.

The foregoing account is as near the number of plants as can poſſibly be aſcertained, and is certainly rather under than over the quantity.

The land has been meaſured, and amounts to 31 acres, 3-qrs. 26 roods, in the pariſhes of Chalk, Higham, Frindſbury, and Shorn; and the number of plants 442484; all which were planted between the years 1763, and 1778.

The planting of Aſh I have paid great attention to, and am certain, from my method, it will pay me well for my trouble; known facts are the beſt proofs, and if any gentleman has a deſire to ſee them, I ſhall be happy to ſhew my plantations, which I think will do me credit, and doubt not of their giving ſatisfaction. By experience I find there is an eſſential difference between Wild Aſh and thoſe that are trained; let all the crooked ones be rejected, and in particular be careful in getting the Aſh-keys, which few people attend to.

The foregoing account is as correct as I can poſſibly give, if any further information is wanted, I will wait on the Society with

with my book of expenſe, and beg leave to ſubſcribe myſelf,

The Society's moſt obedient,

humble Servant,

DAVID DAY.

Little-Hermitage,
Frindſbury, near, Rocheſter, Kent,
November 14th, 1778.

N. B. There is another advantage in planting thicker one way than the other, if you take care to plant your rows properly, to let the ſun in as much as you can, you may crop the alleys; which I did in four acres, with potatoes, and had ſixty ſacks, which ſold for £13 10s. The year following I had eighteen ſacks, worth £5. which were kept for my own uſe.

Some of the Aſh plants ſhot ſix feet the firſt year after ſtubbing, the third years ſhoot from eight to ſixteen feet.

OBSERVATIONS from EXPERIENCE.

In woods that are planted thin, or in wild woods, I have obſerved in very large

ſtubs, that there have been a great many ſhoots for two or three years, then many of the ſhoots have dyed away, and when they have been fit for cutting, there have been very few more hop-poles than in a middling ſized ſtub; if planted thick your ſtubs will not be ſo large, your ſhoots will be more even, and not dye away ſo much, and you will have a great many more poles, particularly of the beſt poles. When I have talked to old planters (who are bigotted to their own way) they have told me I plant too thick, their reaſon is (though in my opinion a very abſurd one) that in thirty or forty years, my wood will be too thick; ſuppoſing that to be the caſe (though I do not believe it) my anſwer is, would you loſe a crop for thirty or forty years, when you may have as good a one the firſt fall as you will get at the forty years end? and then, if they are too thick, a man with a mattock, for ten or twenty ſhillings per

acre,

acre, will make your wood as thin as you like.

I have obſerved many ſtubs forked and crooked, like a bottle ſcrew, which I believe is owing, in a great meaſure, to not caſting the crooked plants, and omitting to make choice of ſtraight well limbed trees, from which to get the keys.

I have planted a few wild aſh; and have bought ſome nurſery plants; thoſe I have raiſed are much better than either. It would pay me to take up the wild ones, and replant with thoſe of my own training.

The Gold medal being the premium offered for planting Aſh, was adjudged to Mr. David Day, of Frindſbury, near Rocheſter, in Kent, in the year 1780, *from whom the following letters were received.*

To the Society for Encouragement of Arts, Manufactures, and Commerce.

Little Hermitage, near Rocheſter.

Gentlemen,

I ONCE more take the liberty of laying before you an account of my planting Aſh, for timber and underwood, in the year 1780, with my method of planting, which I find by twenty years experience, much the cheapeſt and eaſieſt way I have yet purſued.

	£.	s.	d.
Jan. 11, 1780. To ploughing four acres, Barley Gratten, in Stone Field (very deep) in the pariſh of Frindſbury. -	2	0	0
To taking up and planting 10800 Aſh Plants, in ditto, at 9d per hundred. - -	4	1	0

Dug

	£.	s.	d.
Dug the holes a ſpade deep, planted four feet ſquare; the land being poor, thought it was as many plants as the ground would bear; I have ſown the ſame land with woold, which promiſes fair to anſwer very well, and will make me pay great attention to keeping the land clean.			
To ploughing three acres in hay lands, in the pariſh of Shorn, at 10s. per acre. -	1	10	0
To taking up and planting 8100 plants in ditto, at 1s per hundred. - -	4	1	0
Dug the holes a ſpade deep; the land working worſe than the four acres, ſtone field, obliged me to give 3d. per hundred more, planted four feet ſquare.			
To twice ploughing one acre in Long field, in the pariſh of Higham. - - -	0	18	0

	£.	s.	d.
To taking up and planting 5400 plants in ditto, at 1s. per hundred - - -	2	14	0
Planted only four feet by two feet, a ſpade deep.			
To planting half an acre, in Great Field, in the pariſh of Frindſbury, a hedge row, 1500 plants, at 1s. per hundred.	0	15	0
To planting hedge row, half an acre, in large Hop ground, in the pariſh of Frindſbury, 1500 plants, at 1s. per hundred.	0	15	0
Grub'd and carried the mould away, which paid more than the expenſe of grubbing, &c.			
To 2000 plants in Chalk Hole, about one acre, at 1s. per hundred. - - -	1	0	0
To carriage of 29300 plants to ſaid fields. - -	1	0	0

The

	£.	s.	d.
The ſaid pieces of land were all planted between the 11th of January and 25th of March, 1780.			
Oct. 20, 1780. To ploughing a field called Piper's acre, eleven acres cloverlay, in the pariſh of Higham, very deep, with ſix horſes, it ploughed very well, and four acres in the pariſh of Shorn, very deep, at 8s. per acre. - - - -	6	0	0
To ploughing two acres Wheat Gratten, in the pariſh of Higham, at 8s. per acre.	0	16	0
To taking up 120,000 plants, at 1½d. per hundred. -	7	10	0
To triming ditto, at 1½d per hundred. - - -	7	10	0

N. B. The reaſon of my having the plants taken up ſo cheap, is my method of planting,

ing; they ſtanding only four inches apart in the rows, and two feet between; I take up every other row, and thin the ſtanding row two feet diſtance, which wants nothing more than raiſing up with a mattock. The plants are all four years old, and run from five to twelve feet long, and are allowed by judges to be the beſt nurſery in this county; I believe I may ſay in England.

	£.	s.	d.
To five days work with my team, carrying the plants to the ſaid fields, at 10s. per day	2	10	0

Having ſo large a quantity to put in, neceſſity obliged me to contrive a more ſpeedy and cheaper method than digging the holes, which I think anſwers the purpoſe full as well, if not better.

I took

	£.	s.	d.
I took a common ſtrike plough, added mould boards to it a little wider than common, put in four horſes double, and ſtruck the ſaid fields in rows, very deep, two feet apart, planted every other row two feet apart in the row, which took up 5500 plants on every acre; I find by experience this is not too thick on good land; the land is kept clean much cheaper, and turns ſooner to profit.			
To ſtriking ſaid fields, ſeventeen acres, at 3s. per acre.	2	11	0
To planting 94000 plants, at 1½ per hundred. -	5	17	6

The land being ſo well prepared to receive the plants, the men had little more to do than to draw the earth to the plants with their feet, and tread them up; each man would put in

1100 or 1200 a day, though in the ſhorteſt days of the year.

I had what I call hand packers, which each man carried in his hand, with which, when he came to a larger rooted plant than common, he made the drill ſomething deeper.

One acre of nurſery, in the pariſh of Higham, thined and replanted at a proper diſtance for a wood, two feet by four feet.

Four acres of nurſery in the pariſh of Shorn, thined and replanted at a proper diſtance for a wood, two feet by four feet; I mention replanting, though I do not believe I planted fifty plants in the above five acres, the nurſeries having taken ſo well that there were no gaps in them.

Note.

	£.	s.	d.
Note. The ground being ready, and the plants on the ſpot, it required only two days work for ten hands to complete the ſaid plantations.			
What the froſt prevented our finiſhing in December, has ſince been completed, but it being moſtly head lands, it was neceſſary to dig holes to plant moſt of them, for which I gave the men	0	10	6
	£ 51	19	0

Out of the above £51 19s. there was expended for ploughing, ſtriking, and carriage of plants. - - -	17	5	0
For hand labour only -	34	14	0
	£ 51	19	0

The

The Number of Acres planted in the Pariſhes of Frindſbury, Shorn, and Higham, in 1780.

		Acres	Roods
In Frindſbury	Stone Field	4	0
Ditto	Waſte Land in Great Field -	0	2
Ditto	Large Hop Ground	0	2
In Shorn	Part of ſixteen acres	3	1
Ditto	Chalk Hole Piece	1	0
Ditto	A four acre field	4	0
In Higham	Longfield -	1	0
Ditto	Piper's Acre	11	0
Ditto	A two-acre piece	2	0
Ditto	Part of Longfield was a nurſery	1	0
In Shorn	A nurſery -	4	0
		32	1

The

The number of plants taken up in whole - -	149,300
The number of plants in nurſery, which are left to ſet out for woods - -	27,500
	176,800
Out of which number I planted in hedge rows, and mended my old plantation with -	18,700
Sold - - -	7,300
	26000
Deduct	26000
Total of what was planted in the above 32 acres and 1 rod.	150,800

The plants coſt me nothing, as I have ſold more than pays the expenſe of raiſing them; I ſold them from 5s. to 10s. per hundred, but very few at 10s. yet if valued, they would amount as follows.

150,800 plants at 5s. per hund. £ 377 0 0

The

The above plantations are all properly fenced and ſecured, the land my own, and the account of expenſes, &c. is as juſt and correct as poſſible.

I have been told by perſons who are judges, that my method of planting, as well as the plantations, are worthy notice. If any Gentlemen will do me the honour to view them, I ſhall be happy to give them every information in my power, which I think my duty, for the honours conferred on,

Gentlemen,

Your much obliged,

and obedient humble ſervant,

DAVID DAY.

The

The following is the account of the Plantation of Scotch Firs, for which the Gold Medal was adjudged to Francis Moore, of Aſpley Guiſe, Eſq. in the Year 1779.

To the Society for the Encouragement of Arts, Manufactures, and Commerce.

Gentlemen,

THE peruſal of your annual book, wherein you offer premiums, induced me to become a candidate for your favour, and humbly to ſubmit the following account of Plantations of Scotch Firs, and the conſequent improvement of barren (and otherwiſe uſeleſs) land, to your attention.

I live in a part of England, about forty miles diſtant from London, where ſome of the land is exceedingly ſandy, poor, and mountainous, and totally unfit for cultivation, at leaſt the expenſe of cultivating

it would coſt infinitely more than the value of the land when cultivated, ſo that many hundred acres now lie barren, and apparently of no kind of uſe or benefit whatever; ſuch was the ſtate of the land marked AC and D in the plans. || Timber and fuel of all kinds being very dear;* and obſerving ſeveral ſmall plantations of Scotch Firs to proſper very well upon this ſoil, I was induced to make various plantations at different times and ſeaſons, for ſeveral years paſt, and it is with the utmoſt pleaſure I can aſſure you, it has been attended with great ſucceſs. The plants are in a very flouriſhing condition, many of which have made ſhoots of three feet, and upwards, within the year.

I am convinced, by various inſtances, and frequent obſervations in the neighbourhood, of ſeveral ſmall plantations of Scotch Firs, of the reſpective growth of

|| The plans referred to are preſerved in the Society's Collection.

* Coals 17d. and 1s. 6d. per Buſhel. Faggots 1l. 1s. per hundred.

twelve

twelve, ſixteen, twenty, and twenty-ſix years, that being thined at twelve, ſixteen, and twenty years growth, reducing the number of trees to one fourth, or 676 trees, there will remain a profit from the ſale of the trees, at the reſpective ages, twelve, ſixteen, and twenty years, to defray every expenſe the planter has been put to, with the clear profit of 676 trees per acre, which at the age of twenty-ſix years may be fairly computed to be of the value of 1s. 6d. per tree, or nett profit, £50 17s. per acre, beſides the pleaſing reflection of its being of the utmoſt utility to the poor, by leſſening the price of fuel; the addition it makes to the beauty of the country, and the certainty of lowering the price of timber, and upon ſuch a barren ſpot and ſoil, as could not be turned to any other advantage or benefit whatever. I am ſo thoroughly convinced of the good conſequences attending this method of planting upon this ſoil, that I have now ſeveral hundred thouſand

of Scotch Fir plants, raiſed by myſelf, in my nurſery beds, which I ſhall plant out when of a proper age and ſeaſon.

Gentlemen, If this ſhould meet with your approbation and encouragement, it would add very much to the pleaſure I have for many years experienced, and be conſidered as the greateſt honour conferred on,

Gentlemen,

With the greateſt reſpect,

Your moſt humble ſervant,

FRANCIS MOORE.

By

By Plans annexed to the foregoing account, it appears, that

		Trees
19	Acres were ſituated in the pariſh of Wavendon, in the county of Bucks. -	51376
1	In the pariſh of Aſpley-Guiſe, in the county of Bedford.	2704
1	Wavendon, in Bucks. -	2704
1	In Aſpley-Guiſe, in Bedfordſhire. - - -	2704
22	acres	59488

The Thanks of the Society were ordered to Dr. William Fordyce, for the following Communications.

25th January, 1776.

SIR,

I ordered a buſhel of my Siberian Wheat, that grew on my farm, at Hyacinth-Hill, Wandſworth Common, to be left for you that it might be weighed, compared with our Autumnal or Spring Wheat, ground in one of the Society's mills, and ſome of it baked into wheaten and parliament bread, and the goodneſs of it aſcertained, now that this ſeed has been cultivated in England three ſeaſons. I was favoured with the ſeed, of which this is the produce, by Mr. Farmer Ducket, ſo well and ſo deſervedly known and reſpected.

The ground on which it was ſown, was firſt turned up from common ground, in 1764 (being at that time full of alternate

nate clay and gravel pits, or covered with thorn and furze) ſince which period it has been alternately under crops of Wheat, Turneps, Clover, Oats, or Tares, till July, 1774, when a crop of Tares was cut off from it, and made into Hay. After a good coat of compoſt, made in the farm-yard, of loom, fern, horſe and cow-dung was laid on it, we ploughed for Turneps, which were ſown by the 20th of Auguſt, and they were then taken off the ground, at five guineas per acre, by the cow-keepers of Southwark, about the middle of March, 1775.

Between the 25th of March, and the 4th of April, we ſowed two buſhel of the Siberian Wheat per acre, on four or five-bout ridges, laying it down with Red Clover, Dutch ditto, and Rye Graſs Seeds, in the uſual quantities. As it is now only threſhing out, I cannot ſpeak of the product but by the tythe, which makes it two quarters per acre; it was reaped

with a ſickle, on the 7th and 8th of Auguſt. On the 20th of September it ſhewed as fine a crop of Red Clover in flower, as ever was ſeen, and was mowed for clover hay, yielding by the computation of my gardener and labourers, one tun and half per acre, beſides ten days cut clover for my three cart horſes from five acres. When it ſtood in the ear, the furrows of the ridges were not to be diſtinguiſhed from the tops of them, ſo full were they of the wheat, as if the whole ſurface had been level.

As fodder is often ſcarce in many parts of England, in the neighbourhood of London, or other large towns, even where manure is plentiful, perhaps it would be a grain to lay down graſs ſeeds with, preferable either to Oats, Barley, or Spring Wheat; as in good ground and favourable ſeaſons, it would at leaſt help young ſtock through the winter, beſides furniſhing a crop of good clover to feed your working horſes,

horſes, in the autumnal ſeed time. If you think proper to lay this information before our moſt reſpectable and uſeful Society, I leave it in your power to do ſo, and remain,

Yours, &c.

WILLIAM FORDYCE.

P. S. I have kept two ſaddle horſes ſince October laſt, on boiled Cluſtered, or Surinam Potatoes, inſtead of Oats, unleſs when they have gone beyond the five or ſix mile ſtone; and have raiſed ſuch a quantity of this ſort of Potatoes, in lazy beds, on the deepeſt clay ground, as I will not affirm to you, unleſs the witneſſes to the facts were preſent, but believe an acre of ground properly cultivated with them, will pay better than any crop about London, provided they are applied to the feeding of horſes, inſtead of corn, and which food (a quarter of a peck per day) will probably ſubject the half-

half-bred horſes, that ſtand in London ſtables, to leſs degrees of the greaſe than oats.

Mr. Moore, Secretary to the Society for the Encouragement of Arts, &c.

Twenty Pounds being the Premium offered for cultivating Turnep-rooted Cabbage, was adjudged to Mr. Lewen Tugwell, of Beverſtone, in Glouceſterſhire, in the Year 1777.

Mr. Secretary,

LAST year I was ſucceſsful in cultivating the Turnep-rooted Cabbage, for the raiſing ten acres of which, the Society for the encouragement of Agriculture, &c. offers a premium of twenty pounds. As my field is about thirteen acres, upwards of ten of which, I have the greateſt reaſon to believe was exceedingly good in its kind, I take the liberty of endeavouring to avail myſelf of ſuch the Society's generous propoſal.

In

In conſideration of the very great and ſingular utility the plant (if generally adopted) might be of to the natives of this kingdom, of which (ſituate in a barren part of it) I humbly conceive my cultivation and ſucceſs, ſimply amounts to proof indubitable; I preſume it may be right in me to trouble you with a conciſe account of ſome obſtacles I therein met with, as it may ſerve to evince how eaſily practicable, on tryal, the culture will always be, with others not liable thereto.

The field on which my plantation was made, is what, among our lands, we reckon a good ſandy loam; but being the year before under wheat, the property of my predeceſſor, came to my uſe exceedingly impoveriſhed, and in the moſt filthy condition of any I ever had ſeen; and as, prior to my undertaking, it had received two fallowings, cutting each other tranſverſwiſe, the whole was thrown into clods

of

of about nine inches ſquare, and theſe ſo matted with roots of couch-graſs, &c. that after repeated hoeings, I found the reducing of them quite impracticable; otherwiſe, and had I moreover been better ſerved by my ſeedſman, my crop, I have every reaſon to believe, would have been abundantly greater than it was. However, having, in a very aukward manner, with ploughs, drags, &c. tumbled theſe clods about, I at Midſummer gave the field about twelve cart loads of farm-yard dung to an acre, and immediately ploughed it on to one-bout ridges, and in the middle of each covered up the dung. On each of theſe I immediately, at two feet diſtance from each other, ſet out a row of plants from the ſeed-bed, which had been ſown, about eight weeks before. When I thought they were ſufficiently rooted, I gave them a hand hoeing, to which immediately ſucceeded a horſe hoeing, by the common ſwing plough, fetching on either ſide a

furrow

furrow from each row, and throwing it into the middle of the intervals; and this being in due time returned back again to the plants, the cultivation was compleated. After this they ſoon began to flouriſh ſurprizingly, threw out an amazing luxuriance of their foliage, and at intervals continued growing throughout the following winter.

Toward the middle of April, when the common turneps, rape, &c. (after a very ſevere winter) were all conſumed, and many of my neighbours flocks, in conſequence thereof, in the greateſt diſtreſs imaginable, I turned in my Tegs (or one year old ſheep) ewes, lambs, &c. to the amount of upwards of four hundred, and had every reaſon to be pleaſed with the effect; refuſing their hay, they fed wholly on the turneps, and having continued between five and ſix weeks, went off greatly improved.

Sometime after the firſt had been introduced, three hundred Tegs more were brought

brought on, from the ſingular ſeverity of the ſeaſon, in a very ſtarving condition, the property of a neighbour, who at its commencement had greatly ridiculed my procedure. Theſe remained not quite a fortnight, however, without any aſſiſtance from hay, &c. went off likewiſe very much amended.

About the 18th of May I turned them all to their paſture, hauled great quantities of the roots, in high perfection, to adjoining avenues for manure, and at a very late ſeaſon ſowed the field with barley, and notwithſtanding the remarkable inclemency of the weather, during almoſt the whole of the ſummer afterwards, have, from this eaſy eligible mode of cultivation, and conſequent ſoiling of the ſheep afterwards, a return of almoſt three harveſt loads from an acre, throughout the field.

I am, Sir,

With the greateſt eſteem,

Your reſpectful claimant, &c.

Oct. 15, 1777.

Mr. Moore.

N. B.

N. B. As the number of our ſheep have always been governed by what we have hitherto been enabled to ſupport during the ordinary exigencies of the ſpring, it is more than probable, was this plant generally received, our flocks might be conſiderably increaſed, the arables proportionably benefited thereby, and many fatal conſequences, reſulting from an abſolute want of food at that ſeaſon, radically prevented.

This our farmers now perceive and acknowledge, and with one conſent giving in their teſtimony and approbation of the culture of this vegetable, have ſome of them, from my late ſucceſs, already begun to put it in practice.

Thirty Pounds being the Premium offered for an Account of the Culture and Uſes of the Turnep-rooted Cabbage, were equally divided, in the year 1780, *between Mr. Lewin Tugwell, of Beverſtone, and Mr. Thomas Robbins, of Bowldown Farm, near Tetbury, in Glouceſterſhire, from whom the following Letters were received.*

SIR,

HAVING by me the Society's deſcription of models, machines, &c. I have obſerved on the liſts of donations therein, that it is no uncommon thing for a perſon to be honoured with a ſecond premium, for a matter of a ſimilar nature with that, for which he had received a former gratuity. Hence, after gratefully acknowledging their laſt years favour, for cultivating Turnep-rooted Cabbage, I am encouraged to ſubmit to the conſideration

of

of the Gentlemen of your Committee, an account of my having again attempted, and ſucceeded, in the raiſing that article.

The field for this ſecond experiment conſiſted of only eleven acres, and as my farm, when about two years ago I entered on it, was in general filthy, and greatly impoveriſhed, and as I make theſe take a part with the common turneps, in recovering the moſt worn-out quarter, the crop was not ſo large as that of the preceding year. This however I chiefly impute to the ſummers having been wet and cold, in an almoſt unheard of degree, whence the land could not receive the benefit by previous fallowings it might otherwiſe have done. My ſeeds were furthermore again moſt execrably bad, and great numbers of the plants of a ſpurious worthleſs ſpecies; but for this I have now a remedy, in raiſing them myſelf, from roots ſelected for that purpoſe.

The ſtock it maintained conſiſted of two hundred and twelve tegs, or one year old ſheep, which it ſuſtained in a moſt deſirable way, during the term of five weeks, and two hundred couples, or ewes with lambs, for upwards of three weeks beſides. Theſe laſt however were ſuffered once a day, to have a run in an adjoining graſs-plat, whereby we find the lambs in particular do much better than when confined to the turnep-field ſolely. The juices of the plant are certainly rich, but being of a ſolid ſubſtance, does not ſupply the milk of the ewe in ſuch quantities, and ſo frequently as is neceſſary.

Intending the land for barley, I thought it would be imprudent to wait longer than about the 18th of May, when I had a great many loads of the roots hauled to the aforeſaid graſs-plat, where the tegs, paſturing, continued at intervals feeding on them until Midſummer, and it was obſerved

obſerved by my neighbours, that although they enjoyed their fill of fine graſs, they were ſeldom known to lye down any where elſe than among the Turneps, while any of theſe remained unconſumed. This I cannot but conſider as a happy proof of the partial fondneſs the ſheep have for this excellent root; and in reſpect of its effects on them, I declare I have hitherto experienced no plant ſo fattening, or that will keep the creatures in more perfect health.

The proceſs of my plantation was conducted the ſame as formerly, that is, the land, having been previouſly fallowed and dunged, was thrown on to one-bout ridges, and at two feet diſtance from each other, a ſingle row of plants ſet out on the top of each; at proper ſeaſons the intervals were afterwards horſe-hoed backwards and forwards, and in conſideration of great numbers of weeds, accruing from the wetneſs of the ſummer, the tops of

the ridges received two dreſſings of the hand-hoe. All of theſe, together with the ſubſequent ſoilings of the ſheep, left the land in admirable condition; and about the 18th of May, as before-mentioned, I ſowed the field with Barley, and reaped a return of a rich and luxuriant crop, in quality remarkably fine.

From incontrovertible facts relative to its utility, this ſpecies ſeems, in this neighbourhood, even to the diſtance of many miles around, to gain ground apace; and ſome of my neighbours, who on account of their ideal notions of the expenſe attending its cultivation, when firſt introduced, decried it at large, poſitively aſſerting no benefit could ever accrue from it to the owner, I have reaſon to believe will, ere long, be fully convinced of the impoſſibility of doing things entirely well without it.

We now find the expenſe (horſe-hoeing excepted) to vary but little from that uſually

uſually attending the raiſing the common turnep; and in conſideration of the comparative ſuperiority of its quality, the greater certainty of the crop ſucceeding (which with thoſe, on account of the fly, is always precarious) its hardineſs alſo in reſiſting every degree of froſt, and the benefit the ſoil eminently obtains from the cultivation, I humbly conceive the plant, in point of real value, to ſtand but very little, if any, behind that ſpecies. It is moreover, as a valuable conſideration, to be obſerved, that, while feeding on theſe, no conſumption of hay has, with us, as yet been made; our ſheep indeed are often ſerved therewith, but they are always as ſure to reject it; and it may, not unlikely, ſometime or other be found, that theſe, on account of their ſingular permanency, may be equal to ſupporting the animals as well without hay, as the others with the addition of that expenſive article; whence, in future, I intend practiſing the culture on a much larger ſcale. I now,

on condition of their proceeding in due form, furniſh my neighbours with ſeed gratis; and it is perhaps worthy of remark, that on an extreme cold day in February laſt, I had not leſs than four orders for Turnep-rooted Cabbage Seeds. Our method of feeding conſiſts in pulling up the Turneps with a hook properly made, which having an edge on its back part for that purpoſe, each root, at a ſingle ſtroke, receives an inciſion through the middle; hence, their external ſurface being very hard, the ſheep feed on them with much greater facility than they would otherwiſe do. Many other obſervations in favour of this plant remain yet to be made, but which however, time and experience only muſt furniſh.

My neighbour Robbins alſo intending this year to ſend up his claim for the premium, I the other day gave him a certificate, authenticating the contents thereof.

His

His method of giving the lambs a backward run on rye-graſs, is certainly deſerving of imitation, and wherein I ſhould have followed him, if I had had any in the vicinage of my plantation. Perhaps no other gramen, at that early ſeaſon (the burnet excepted) will ever, for producing milk in the ewe, be found equal thereto.

I am, Sir,

Your truly obliged, and

Beverſtone,
Oct. 21, 1778. obedient humble ſervant.

LEWIN TUGWELL.

Mr. Secretary,

IN conſequence of the ſucceſs of my neighbour, Mr. Lewen Tugwell, who laſt year obtained of your Society, the premium offered for cultivating the Turnep-rooted Cabbage, I am alſo this year induced to profeſs myſelf a claimant.

Conſidering that the views of the Society extend to nothing leſs than the good

of the community at large, I am happy to inform you, that from obſerving the great advantage that accrued from Mr. Tugwell's experiments, I laſt year attempted the cultivation, and ſucceeded beyond my moſt ſanguine expectations.

Situate on a farm where my late predeceſſor (though a reputable huſbandman) had in vain attempted the raiſing a breeding flock, I had myſelf deſpaired of doing it, and reſolved to ſell all my ewe ſheep, and to keep none in future but of the weather kind; however, having obtained the knowledge of this moſt valuable plant, my ſchemes have now fallen into a new channel, being enabled to keep them in all deſirable health through the ſpring ſeaſon (wherein, as had been conceived, conſiſted an abſolute and unſurmountable difficulty) I now am not only gratified with the pleaſing ſight of ewes and lambs about me, but from the preſent appearance of theſe (being deſcend-

ed

ed from the beſt rams I could procure) am not without hopes of poſſeſſing ere long, a flock equal to any in my neighbourhood, even thoſe paſturing on its moſt fertile meadows.

In the cultivation I thought I had only to follow Mr. Tugwell's ſimple method, that is, of diſpoſing the plants on the top of one-bout ridges, and ſubſequently horſe-hoeing the intervals backwards and forwards; and it is remarkable (notwithſtanding he informed me, from the little experience he has had, that he believes the plant will be found to ſucceed beſt on land rather loomy or heavy) that on a plantation of eleven acres of a ſtony ſoil, light in an almoſt unparalleled degree, I was enabled, through the difficult ſeaſon of the laſt ſpring, to ſuſtain and preſerve, in the moſt deſirable manner, two hundred and ten ewes, with two hundred and twenty lambs for a month; alſo with the refuſe or bottoms, ſuch as the ewes and lambs

lambs left, I kept one hundred and eighty tegs, or one year old ſheep, during the ſpace of ſix weeks. However it muſt be acknowledged, and is indeed proper to intimate, that although during their ſtay thereon I gave them no hay, I nevertheleſs found it eligible to let the ewes and lambs have a backward run on a ſmall adjoining field of rye-graſs; for from the time of their being brought on I had obſerved, that although the ewes appeared to increaſe in fleſh, the lambs were rather behind in that reſpect; and herein I was happy in the concurrent opinion of Mr. Tugwell, who from his laſt year's experience had hinted to me, that he thought the plant in its nature rather tended to fatten animals, than to ſupply milk; it is true my rye-graſs was very trifling in reſpect of quantity, having been fed the preceding winter; however it had a very deſirable effect, and from the time of their being introduced thereto, the lambs were obſerved to recover.

Previous to my ſetting out the plants, the field had, the ſame ſeaſon, been under vetches, which were ſoiled, or fed off, with ſheep. I then ploughed it, gave it ſome dung, and threw the land into its proper form for planting. At Midſummer the plants were ſet out, at about eighteen inches aſunder in the rows, and the rows, or ridges, about thirty-ſix inches apart. As ſoon as the weeds began to ſpring up, and I obſerved the plants wanted ſome aſſiſtance, I had them hand-hoed. Some time after I ſent my ploughs to throw up a ridge in the intervals, which, after remaining as long as was neceſſary, was thrown back again to the plants. I ſome time after that gave them another hand-hoeing, by which means my land was put in the fineſt tilth imaginable, and the plants had all the aſſiſtance requiſite.

In the ſpring, intending to ſow the land with barley, I was neceſſitated to haul

haul off ſeveral loads of the roots, and although my ſeed was not committed until the 14th of May, and the ſeaſon proved remarkably dry after, it is an indiſputable fact, that I reaped near three loads from an acre, which extraordinary increaſe, as I impute it to the ſuperior mode of cultivation, would, with me, always be ſome inducement to the propagation of this moſt valuable vegetable, even if I had no further views therein.

I am, Sir,

Yours moſt reſpectfully, &c.

THOMAS ROBBINS.

P. S. I have the pleaſure to inform you, that the cultivation of this moſt excellent plant bids fair to become general in this part of the country, as many of our principal farmers have ſome of it growing this year, and after having given it a fair trial, I preſume they will be fully convinced of its utility, and continue the culture of it.

SIR,

Beverſtone, March 3, 1779.

SIR,

YOURS of the 1ſt of February I have now before me, with the queries relative to my laſt year's Turnep-rooted Cabbage. The ſeeds ſown the preceding ſpring were not committed (occaſioned by an accident) until the 9th of May, a period, as I then conſidered it, a fortnight too late; but, for reaſons that will occur in anſwering the other queries; it is now a maxim with us, that in ſuch ſituations as ours, if no accident forbids it, they ſhould be ſown before the middle of April.

As the earth of the ſeed-bed ought to be good, and as free from ſeed weeds as poſſible, I have for thoſe reaſons, and for ſecurity againſt caſual depredations, uſually ſown my ſeeds in a garden, but not on a hot-bed, there being always time enough in the ſpring for raiſing the plants to a ſize ſufficient for ſetting out from the natural

ſoil.

ſoil. However, with ſome in our neighbourhood, an eligible practice has taken place, of throwing off the mulch, together with an inch or two of the ſurface mold, from ſome immediately prior winter ſheep fold, in a warm corner, in or contiguous to the field to be planted with the Turnep-rooted Cabbage; the under mould is then, with the ſpade or plough, moved to the depth of three or four inches, and the ſeeds being committed thereto, the plants ſoon make their appearance, and generally grow away in a manner ſcarcely, by any other method, to be paralleled. If, through prudent foreſight, care has been taken previouſly to have conveyed to the aforeſaid ſheep-fold, ſtraw, ſtubble, fern, or whatever may be attainable, ſufficient and proper for making a compoſt for the whole plantation, there will not only be found a great ſaving in the moſt expenſive part of manuring (the carriage) but the materials lying on the ſpot, much more

will

will be executed in any given time, when the ſeaſon, or weather, or both ſhall arrive moſt proper for the buſineſs, and that at a time of the year, when labour in huſbandry is always very valuable.

The plants too, ſituate in or near the field, when drawn, will not lye ſo long out of the ground before they are replanted, and therefore be the leſs liable to injury from their removal.

The excrementitious exhalations ariſing from the earth, and compoſt heaps adjoining, will alſo prevent the depredations of the fly; however this ſpecies, it is obſervable, is ſeldom ſo obnoxious thereto, as any other of the Turnep or Cabbage kind. In whatever ſituation we perceive an attack made on theſe or any others, if wood aſhes are to be obtained, we always find a preventative in ſcattering them lightly over the plants in the dew of the morning. Some have had recourſe to the tedious maxim of dipping their

their roots, when firſt drawn, in a prepared mud, or mixture of earth and water, to preſerve them from the injuries of the external air, but, from experience and repeated obſervations, we find the ſpecies ſo hardy, that, if when replanted the earth is well cloſed about them, there is certainly no occaſion for it. However, when firſt ſet out, it is neceſſary for a boy to defend them a few days from the crows and rooks; the ſagacity of theſe creatures (from ſeeing the plants in a withered ſtate) leading them in queſt of a ſuppoſed deſtructive inſect at its root, they will frequently, without the aforeſaid precaution, draw them up again much faſter than they were planted. In regard to tranſplanting from the ſeed-bed before we ſet out for the laſt time on the ridges in the field, I at firſt had recourſe to that method; but finding it tedious and expenſive, have not practiſed ſince it. However, if no remedy can be found, I muſt ſoon return to it again;

again; for the plants ſtanding too near together on the ſeed-bed, together with ſeed-weeds, which it is frequently difficult to prevent, they are generally drawn up in a trunk, or ſtalk, ſo long and weak, that when planted out, they never regain their natural ſhape. I intend this ſpring to ſow in drills, about a foot apart, whence by the action of the external air, with the hand-hoe occaſionally moving among them, I apprehend the above-mentioned evil may be obviated; a frequent removing the earth of the intervals, and of the roots growing therein, will probably, in effect, be a partial tranſplanting. My crop of laſt year was planted out on the ridges about three weeks after Midſummer; but, as an inſtance of the impropriety of being too late, I have a neighbour who, in his firſt attempt, has this year ſeven acres that were planted ſome time before Midſummer; I have alſo upwards of fourteen acres, which, as I waited for rain, were not planted until

ſix or ſeven weeks after his; and as the drought continued with us till near the equinox, the conſequence is, mine on an average are not more than a pound and a half in weight, while his are probably nearly five pounds. Situated high and cold, with lands none of the richeſt, if we were ſure of weather proper for the buſineſs, Midſummer might notwithſtanding be ſoon enough for tranſplanting to the field; but as that is precarious, we ought at all events to get the plants ſet out, rooted, and growing, by that time. The average weight of my laſt year's crop was probably about three pounds; ſome few amounted to ſix, ſeven, and even eight pounds each; and it was obſervable, that on part of the field planted three weeks before the other part, the roots were much the largeſt. The ewes and lambs were turned in upon them the 9th of April, and drawn off the 2d of May. The one year old ſheep were introduced April the 13th, and taken away the 18th of the following

following month. The graſs-plat on which the ewes and lambs were occaſionally ſuffered to paſture, is about eighteen acres, half of which however would have been very ſufficient; for after all, a great deal conſiſts in their having a turf to enjoy themſelves on. Young lambs, in whatever caſe, confined with hurdles on an arable field, are ſeldom known to do well. The moſt eligible method of any I have an idea of, would conſiſt in hauling the roots, ſome time in April, entirely off from the field whereon they grow, and throwing them promiſcuouſly about on ſome adjoining paſture, or field of rye-graſs, clover, &c. (to be ſown with wheat the enſuing ſeaſon) in either of theſe ſituations to let the ſheep be regularly introduced to them, with hurdles, as they would otherwiſe have been on the arable. The roots, I humbly conceive, would be much the better for ſuch management, in that they would be prevented from throwing out their juices into leaves and branches,

and the land whereon they grew, might in conſequence, in the proper ſeaſon, be ſown with barley, the want of which, I am perſuaded, may otherwiſe prove the moſt inſurmountable obſtacle to the general cultivation of this moſt opportunely ſerving and valuable plant,

I am, Sir,

Your moſt obedient humble ſervant,

LEWEN TUGWELL.

The Gold Medal, being the Premium offered for planting Lucerne, was adjudged to John Pratt, Eſq. of Poorfleet, Eſſex, from whom the following Account was received. 1780.

My Lords and Gentlemen,

AGREEABLE to the deſign of the Society, and as a candidate for your premium for an account of the cultivation and produce of Lucerne, I take the liber-

ty

ty to lay before you the following experiments and obſervations. In a field of good hazle loam, neither too light, nor too ſtiff, the ſoil about three feet deep, with a chalky bottom, the land inclining to the north-eaſt: the ſoil of the lower part of the field is ſtiff, tending to a clay; I do not know whether any chalk lies under this part, but the plants do not ſhew any difference from the ſoil.

The field in 1773, had borne turneps, properly hoed and fed off with ſheep, and on April 13th, 1774, after the land had had two ploughings and harrowings, the ground being fine, began to ſow in drills, twenty inches diſtant, by a line, on two acres, and uſed about twelve pounds of ſeed, that is, ſix pounds on each acre, and covered the ſeed with a garden rake.

In May and June the fly made great havock, ſo that at different times the ſowing

and hoeing were repeated until the 5th of July, when the rows were complete, and thoſe parts that were not damaged by the fly, were in a thriving ſtate; on the 30th of July began to cut, and by the 20th of September, it had been cut all over once. The latter end of October laid ten load of rotten dung on each acre, and, with a ſmall plough, turned the earth each way out of the alleys, over the plants, ſo that the land appeared like a fallow.

1775. In this ſtate it lay until the 20th of February following, when it was buſh-harrowed croſs-ways, to lay the ridges down into the alleys again.

In April mended ſome trifling places. May 27th began to cut, it being then about twenty inches high.

June the 30th. Began to cut the ſecond time, and followed this cutting with a horſe-

horſe-hoeing in the alleys, and hand-weeding in the rows.

Auguſt the 7th. Began to cut the third time.

September the 26th. Began to cut the fourth time.

November the 6th. Dunged and ploughed as in the laſt year.

1776. The weather being wet, could not buſh-harrow until the 12th of March, and on the 27th, as the plants grew faſt, gave it a perfect hand-weeding in the rows. Began cutting in May, and during this ſummer cut four crops, horſe-hoeing the alleys each time of cutting; hand-weeded again in September, and in November dunged and ploughed the alleys as laſt year.

N. B. In May this year ſowed near two acres more, adjoining to the above piece, which land had the preceding winter borne cabbages, which were taken off be-

fore Chriſtmas, and the land then ploughed and prepared for ſowing.

The plants came up well, and no accident happened from the fly; cut this ſowing once this year, and cultivated them as the other Lucerne.

1777. February the 28th. Levelled the ridges with a buſh-harrow. May the 22d. Began to cut, and cut four crops this ſummer, horſe-hoeing after each cutting. Hand-weeded the rows in October, and in November dunged and ploughed the alleys as before.

N. B. In May this year added ſeven rows to make out the quantity four acres. Theſe came up well, except one row, which in all probability, by neglect, was not ſown. The ſix rows were cut once, and treated as the former young plants.

1778. February. Harrowed down as before. May the 4th began cutting, and cut four

four crops this ſummer. The laſt cutting was finiſhed the 30th of October, when the land was treated as in the former years.

From various cauſes, owing principally to an obſtinate ſervant, no account was kept before this year, what cattle it would maintain; but this year the four acres kept eleven horſes, from the 4th of May to the 31ſt of October, they having only half their uſual allowance of corn, and yet they improved much. There were likewiſe three additional horſes fed from the above Lucerne ſeventy-four days.

1779. February. Buſh-harrowed as uſual. May the 7th. Began to cut, and fed ten horſes. May the 21ſt. Added two horſes; but before the whole of the four acres was cut, the part where the cutting began had grown ſo luxuriantly, as to be in flower; twenty-one additional horſes were therefore added, and fed during ſeven days,

days, before we began to cut the ſecond time, which was on June the 24th.

Auguſt the 3d. Began to cut the third time.

September the 9th. Began to cut the fourth time.

The plants continued growing in ſuch a manner, that by the time the whole four acres had been cut over, which was done by the 10th of October, the part firſt cut was grown twelve inches high. It being then too late in the ſeaſon for another cutting, fifteen head of horned cattle were turned in for eight days; then gave it a hand-weeding; dunged and ploughed as before.

The produce this year maintained ten horſes twenty-two weeks, two horſes twenty weeks, twenty-one horſes one week, and fifteen head of cattle eight days.

OBSERVATIONS.

The land which bore cabbages preferable to that which bore turneps, being much cleaner.

May is a proper month for ſowing; hand-hoeing and weeding are requiſite the firſt year, as the plants are too tender for the horſe-hoe. Cutting once only the firſt year, gives the roots time to ſhoot down and gather ſtrength.

Horſe-hoeing the alleys after every cutting, and hand-weeding the rows in March or April, are neceſſary: but before it is laid up for the winter, ſhould not on any account be omitted. After the laſt cutting and weeding, let ten or twelve loads of rotten dung be laid on each acre, and gathered up with a ſmall plough, to form the ridges over the crowns of the roots; nothing more is neceſſary until the firſt dry day in February, then buſh-harrow the ridges down into the alleys.

The third year the plants appear to arrive at their perfection, as I do not perceive

ceive they have improved or diminiſhed ſince that time.

Neither does dry or wet weather materially affect its growth, as I obſerved by frequently tying a ſilk thread on ſome plants. It grows about an inch a day, but ſomething leſs, if the weather is cold.

This graſs has the effect of ſalt-marſhes, it purges, and is diuretick for three or four days, and then fattens horſes at a great rate, although hardly half the uſual allowance of corn is given.

Sheep ſhould not be permitted to bait on it, as they will ſcoop the crowns of the roots, and deſtroy thoſe buds that are formed round the crowns for the ſucceeding crop; but that is not the caſe with horned cattle.

The drills of the firſt two acres were made by a line and a hoe, but the drills of the laſt two acres were made by taking out the teeth of a horſe-rake, and fixing

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in ſome angular teeth, like the angular chiſſel of the wheelers, at twenty inches diſtant, which performed the work well; and the laſt two acres were done for half the expenſe of the firſt two acres.

CHEMISTRY.

Premiums for Diſcoveries and Improvements in Chemiſtry, Dying, and Mineralogy.

114. KELP. For the greateſt quantity, not leſs than four tons of Kelp, containing a much larger proportion of Alkaline Salt than any Kelp now made for ſale; the gold medal, or twenty pounds.

A ſpecimen of one hundred weight, to be produced on or before the firſt Tueſday in January, 1784; together with Certificates that the whole quantity is equal to the ſpecimen, and made in Great-Britain or Ireland, of Sea Weed.

115. BARILLA. For the greateſt quantity of merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, raiſed in Great-Britain; the gold medal, or twenty pounds.

A ſample of not leſs than twenty-eight pounds, with a Certificate that half a ton has

has been made, to be produced on or before the firſt Tueſday in January, 1784.

116. NATIVE FOSSIL FIXT ALKALI. To the perſon who ſhall diſcover in Great-Britain, Ireland, or the Britiſh colonies, and bring into the port of London, in the year 1783, the greateſt quantity, not leſs than two hundred weight, of the Native Foſſil Fixt Alkali, fit for the purpoſes of the ſoap-makers; the gold medal, or thirty pounds.

A ſample, not leſs than fifty-pounds weight (as got out of the earth) with Certificates deſcribing the place where found, and the quantity brought in, to be produced on or before the firſt Tueſday in January, 1784.

117. NATIVE FOSSIL FIXT ALKALI FROM THE EAST-INDIES. To the perſon who ſhall import into the port of London, in the year 1784, the greateſt quantity, not leſs than half a ton, of the Native Foſſil Fixt Alkali, fit

fit for the purpoſes of the ſoap-makers, being the produce of any part of the Britiſh poſſeſſions in the Eaſt-Indies; the gold medal, or thirty pounds.

A ſample not leſs than fifty pounds weight, with proper Certificates, to be produced on or before the laſt Tueſday in January, 1785.

118. FOSSIL FIXT ALKALI. For diſcovering the beſt method of obtaining from ſea ſalt, the Natron, or Foſſil Alkali, in a pure ſtate, fit for the purpoſes to which Fixt Alkaline Salts are applied, and at an expenſe that will not render it too dear to be uſed in bleaching, ſoap-making, dyeing, and other great works, where pearl-aſh, pot-aſh, barilla, or kelp, are now employed; the gold medal.

A ſample of fifty pounds weight, and Certificates that two hundred weight at leaſt had been manufactured by the candidate, to be produced on or before the third Tueſday in December, 1783.

119. PRE-

119. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the ſeeds of plants in a ſtate fit for vegetation, after having been kept a conſiderable time, ſuch method being ſuperior to any known to the publick, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſday in December, 1783; the gold medal.

120. POPPY SEED, FOR OBTAINING OIL. To the perſon who ſhall cultivate the greateſt quantity of land, not leſs than ten acres, with White Poppies, for the purpoſe of extracting oil from the ſeed; the gold medal, or twenty pounds.

CERTIFICATES of the quantity of land ſown, and of the ſeed produced, and alſo that the whole of the ſeed has been uſed for the purpoſe of extracting oil from it; to be delivered with a ſample of not leſs than two gallons of the oil, and an account of the proportion of oil obtained

from the ſeed, on or before the third Tueſday in January, 1784.

N. B. The Society have been informed that the oil of Poppy Seed is not only proper for the uſe of painters, but equally palatable, wholeſome, and fit for the ſame purpoſes as the beſt olive oil.

121. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a method of deſtroying or burning the ſmoke of fires belonging to Steam Engines, Furnaces employed in calcining or ſmelting metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the firſt Tueſday in January, 1784; the gold medal.

122. SUBSTITUTE OR PREPARATION OF YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or Preparation of Yeaſt, for fermenting liquors, and raiſing bread, that may be preſerved for uſe, better than any hitherto generally

generally known; the gold medal, or twenty pounds.

Specimens of the Subſtitute, or of the Preparation of Yeaſt, ſufficient for trials, together with a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1783.

123. INCREASING STEAM. To any perſon who ſhall diſcover to the Society, a method, verified by actual experiments, of increaſing the quantity, or the force, of Steam, in Steam Engines, with leſs fuel than is uſually employed, provided that in general the whole amount of the expenſes in uſing Steam Engines may be conſiderably leſſened; the gold medal.

To be communicated to the Society on or before the firſt Tueſday in January, 1785.

N. B. As it is well known there are methods of preventing the ebullition of liquids, by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether by the addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

124. METHOD OF COMPARING SWEETS. To the perſon who ſhall diſcover to the Society an Index, or practicable method of comparing, meaſuring, and aſcertaining the degrees of Sweetneſs in Saccharine Subſtances; the gold medal.

To be produced on or before the firſt Tueſday in January, 1784.

The

The Silver Medal and Ten Guineas were given to Mr. Clegg, for his Diſcovery of a Subſtitute for Verdigris, in Dying Black, 1782, of which the following is an account, drawn up by himſelf.

MANY articles which are in daily uſe, both in dying and other arts, have been found by chance to be neceſſary, yet ſufficient pains have not been taken to aſcertain the principles upon which they act: of this number is Verdigris; and as this article was imported to us, at a very great expenſe from France, I was induced ſome years ago to undertake a courſe of experiments to inveſtigate the manner of its operation, and from thence to find, if poſſible, an effectual ſubſtitute, cheaper and nearer home. On adding Verdigris to the common ingredients of the black dye, (viz. aſtringents and martial vitriol) the firſt thing remarkable is,

that a quantity of iron is precipitated; for the pieces of Verdigris will be covered over with the crocus of iron, almoſt inſtantly, and a quantity of the copper of the Verdigris is at the ſame time taken up by the diſengaged acid; as appears by the copper coat a knife receives on being held in the liquor: ſo that the vitriolic acid leaves the iron, with which it was combined in martial vitriol, and unites with the copper of Verdigris, and again leaves the copper to unite with iron in its metallic ſtate. The ſame decompoſition happens with lead, if *ſaccharum ſaturni* be made uſe of inſtead of Verdigris, though lead, according to the received doctrine of elective attractions, has a ſtill leſs affinity with iron, than copper has. In fact, I find that *ſaccharum ſaturni* will anſwer nearly the end of Verdigris, and though, as a ſubſtitute to it, we could reap no advantage from it, yet I think it gives us an inſight into the principle

ciple upon which Verdigris is of uſe in the Black Dye, viz. by uniting with part of the acid of the vitriol, and giving the aſtringent matter of the vegetable an opportunity of forming an ink with the precipitated iron in greater abundance, and more expeditiouſly, than it could otherwiſe do. Believing this to be the true manner of its operation, I went to work upon this principle, and ſubſtituted *alkaline ſalts* in the room of Verdigris, as I imagined theſe would be a much more innocent as well as cheaper ingredient; for the acid, or the corroſive metallick ſalts, are the only hurtful ingredients in the dye, and the alkali in proper proportion will unite with the ſuperabundant acid, and form an innocent neutral ſalt, *vitriolated tartar*. Upon the firſt trials, I was ſatisfied of the truth of my conjectures; for in all the experiments which I made in the ſmall way, the aſhes anſwered at leaſt as well as the Verdigris: but in real practice, in the

large, I found myſelf deceived; for upon dying a kettle of hats of twenty-four dozen, though the colour came on ſurprizingly at firſt, yet the liquor ſoon became weak. I made many experiments, which it is uſeleſs here to relate, until I united vitriol of copper with the alkali, which, upon repeated trials, has been found to anſwer perfectly the end of Verdigris. The following, I believe, will be found to be the juſt proportions, though there is ſome difference in the practice of different dye-houſes.

Saturate two pounds of vitriol of copper, with a ſtrong alkaline ſalt (American pot-aſhes, when to be procured, are recommended). The vitriol will take about an equal weight of dry aſhes. Both the vitriol and the aſhes are to be previouſly diſſolved apart. When this proportion is mixed, well ſtirred, and ſuffered to ſtand a few hours, a precipitate will ſubſide. Upon adding a few drops of the ſolution of aſhes,

aſhes, if the mixture be ſaturated, the water on the top of the veſſel will remain colourleſs; but if not, a blue colour will be produced; upon which add more aſhes; there is no danger in its being a little over ſaturated with aſhes. Take care to add the ſolution of aſhes to that of vitriol by a little at a time, otherwiſe the effervescence which enſues will cauſe them to overflow the veſſel: theſe four pounds of vitriol of copper and aſhes, will be equal to about the ſame weight of Verdigris; and ſhould be added to the other liquors of the dye, at different times, as is uſual with Verdigris.

The black, thus dyed, will be perfectly innocent to the goods, rather tending to keep them ſoft, than corrode them, particularly hats, in which there is the greateſt conſumption of Verdigris.

For thoſe who are conſtantly uſing Verdigris, it would be proper to have a veſſel always at hand, containing a ſaturated ſolution

lution of vitriol of copper; and another, with a ſaturated ſolution of aſhes, ready to mix as they are wanted; for I find they do not anſwer ſo well if long kept.

JAMES CLEGG.

Mancheſter, Dole Fields,
January 14, 1782.

Premiums

Premiums for promoting the Polite Arts.

125. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawing of any kind, made with crayons, chalk, black lead, pen, Indian ink, or biſter, by young gentlemen under the age of twenty-one, ſons or grandſons of Peers, or Peereſſes, in their own right, of Great-Britain or Ireland; to be produced on or before the firſt Tueſday in March, 1784; the honorary medal of the Society in gold.

126. The ſame in ſilver for the ſecond in merit.

127, 128. The ſame premiums will be given on the like conditions, to young ladies, daughters, or grand-daughters, of Peers, or Peereſſes, in their own right, of Great-Britain or Ireland.

129. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawings of any kind, made with crayons, chalk, black

black lead, pen, Indian ink, or biſter; by young gentlemen under the age of twenty-one.

To be produced on or before the firſt Tueſday in March, 1784; the gold medal.

130. For the next in merit; the ſilver medal.

131, 132. The ſame premiums will be given for drawings by young ladies.

N. B. Perſons profeſſing any branch of the Polite Arts, or any buſineſs dependant on the arts of deſign, or the ſons or daughters of ſuch perſons, will not be admitted candidates in theſe claſſes.

The following Premium is offered in Conformity to the Will of the late John Stock, of Hampſtead, Eſq.

133. MODELLING FROM THE LIFE. For the beſt model of a head in clay, from the life, and of the dimenſions of

of nature, by perſons of either ſex, a ſilver medallion of the value of three pounds, with the following engraved inſcription: *The premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.*

To be produced on or before the third Tueſday in October, 1783.

134. DRAWINGS OF OUTLINES. For the beſt Outline after an original group or caſt in plaſter of human figures, by perſons of either ſex under the age of ſixteen, the principal figure not leſs than twelve inches; to be produced on or before the laſt Tueſday in October, 1783; the greater ſilver pallet.

135. For the next in merit; the leſſer ſilver pallet.

N. B. Theſe drawings are to be made on paper with chalk, black lead, Indian ink, or biſter, and the originals either to be

be produced to the Society, or to be referred to for their examination.

136. DRAWINGS AFTER PICTURES. For the beſt drawing after a Picture of a Group of human figures, the principal figure not leſs than ſixteen inches, by perſons of either ſex under the age of ſixteen; to be produced on or before the laſt Tueſday in October, 1783; the greater ſilver pallet.

137. For the next in merit; the leſſer ſilver pallet.

The drawings to be made with Indian ink, chalk, or black lead, and of a different ſize from the original, which muſt be produced at the ſame time.

138. DRAWINGS OF MACHINES. For the beſt perſpective drawing, by perſons of either ſex, under the age of twenty-one years, of the model of Mr. Lloyd's Cyder Mill, or any other machine, of which ſuch a drawing has not been made,

in

in the Society's Repoſitory; the greater ſilver pallet; to be produced on or before the third Tueſday in October, 1783.

N. B. Such candidates as propoſe to draw for this premium will be admitted by the regiſter any day (Sundays or Wedneſdays excepted) between the hours of ten and two.

The drawing to which the premium is adjudged, is to remain the property of the Society.

139. DRAWINGS OF BEASTS. For the beſt drawing and compoſition of three or more beaſts after nature, the principal figure to be not leſs than eighteen inches, by perſons of either ſex, under the age of eighteen years. To be made with chalk, black lead, pen, Indian ink, biſter, crayons, or water colours; to be produced on or before the third Tueſday in October, 1783; the greater ſilver pallet.

140. For the next in merit; the leſſer ſilver pallet.

141. DRAW-

141. DRAWINGS OF BIRDS. For the beſt drawing and compoſition after nature of not leſs than three different birds, to be made with crayons or water colours, by perſons of either ſex, under the age of eighteen years; to be produced on or before the third Tueſday in October, 1783; the greater ſilver pallet.

142. For the next in merit; the leſſer ſilver pallet.

143. DRAWINGS OF FRUIT, FLOWERS, OR PLANTS. For the beſt drawing after nature, of fruit, flowers, or plants, to be made with crayons, or water colours, by perſons of either ſex, under the age of ſixteen; to be produced on or before the third Tueſday in October, 1783; the greater ſilver pallet.

144. For the next in merit; the leſſer ſilver pallet.

145. DRAWINGS OF LANDSCAPES. For the beſt drawing of Landſcapes, after nature, by perſons of either

ſex

ſex under twenty-one years of age, to be produced on or before the third Tueſday in October, 1783; the greater ſilver pallet.

146. For the next in merit; the leſſer ſilver pallet.

Each candidate muſt mention, on the front of his drawing, from whence he took his view; and the drawings muſt be made with chalk, pen, Indian ink, or biſter.

147. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original compoſition of five or more human figures; the height of the principal figure not leſs than eight inches, to be made with crayons, chalk, black lead, pen, Indian ink, or biſter, and to be produced on or before the firſt Tueſday in February, 1784; the gold pallet.

148. For the next in merit; the greater ſilver pallet.

To the Maſters of Academies or Schools.

149. TEACHING LANGUAGES. Whereas it has been obſerved that the living languages, or languages ſpoken in ſchools, are much ſooner acquired than the dead languages, which are only taught grammatically.

The Society, deſirous to improve the preſent mode of education, hereby offer the gold medal to the maſter of any academy, or ſchool for boys, ſituated within, or not more than thirty miles diſtant from London, who ſhall within three years, from the date of this advertiſement, teach the greateſt number of ſcholars, not leſs than four, to write, and to ſpeak Latin, in common converſation, correctly and fluently.

Alſo, the gold medal for teaching in the like manner, each of the following languages,

languages, viz. the German, the Spaniſh, and the Italian, being commercial languages, not uſually taught at ſchools in England.

The maſters who propoſe to be candidates for the above premiums, are to ſend notice of their intention to claim them, to the Society, at their houſe in the Adelphi, on or before the ſecond Tueſday in November, 1786. Soon after which, the Society will appoint a day for examining the young gentlemen, and for adjudging the ſaid claims.

And in order to encourage aſſiduity in the ſcholars, whoſe maſters apply for the above premiums, the Society will give to the greateſt proficient in each of the ſaid languages, the ſilver medal.

N. B. Any information for the further improvement of the education of youth, in languages, will be thankfully received.

CONDITIONS.

No perſon who has gained the firſt premium in any claſs, will be admitted a candidate in a claſs of an inferior age; and no candidate ſhall receive more than one premium in one year; nor will they, who, for two ſucceſſive years, ſhall gain the firſt premium in one claſs, be ever again admitted as candidates in that claſs.

No perſon ſhall ever be admitted a candidate in any claſs, in which he has three times obtained the whole of the firſt premium.

No candidate ſhall ſend in more than one performance in any one claſs.

All the claims which are produced each year, before the Committee of Polite Arts (to which premiums or bounties are adjudged) are to remain with the Society ſix weeks after the determination, unleſs the

the candidate, for particular reaſons, do apply to have the performance returned.

No claim for a premium in the Polite Arts will be admitted, that has obtained, or has been produced in order to obtain a premium, reward or gratification from any other Society, or any academy or ſchool.

All performances, that obtain premiums in the Polite Arts, muſt be begun after the publication of ſuch premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing drawings which ſhall have been made or retouched by any other perſon than the candidate, the Society is reſolved upon all occaſions, with reſpect to the ſucceſsful candidates in claſſes 133 to 148 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

Premiums for encouraging and improving Manufactures.

150. SILK. For the greateſt quantity of merchantable Silk, not leſs than five pounds, produced by any one perſon in England, in the year 1783; the gold medal.

Specimens of the Silk, not leſs than one pound, with Certificates that the whole is of equal quality, and produced in England; to be delivered to the Society on or before the firſt Tueſday in January, 1784.

151. For the ſecond greateſt quantity, not leſs than two pounds; the ſilver medal.

152. MULBERRY CUTTINGS. For raiſing the greateſt number of white or black Mulberry Trees, for feeding Silk worms, not leſs than three hundred, from cuttings,

cuttings, in the year 1781, which ſhall be growing in September, 1783.

CERTIFICATES of ſuch raiſing and growth, with the manner of culture, to be produced to the Society on or before the firſt Tueſday in November, 1783; the gold medal.

153. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1784.

154. MULBERRY CUTTINGS. To the perſon who ſhall form the largeſt plantation, not leſs than one acre, of Mulberry Cuttings, for the purpoſe of feeding Silk Worms; the gold medal.

CERTIFICATES of the quantity of land, and that the Mulberry Plants are not more than three feet aſunder; to be produced on or before the firſt Tueſday in December, 1783.

It is propoſed, that this plantation be continually kept in a low ſtate, in manner of a ſhrubbery, to the intent that the gathering the leaves may always be within the reach of women or children.

155. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in December, 1784.

156. MACHINE FOR CARDING SILK. For the beſt machine, ſuperior to any now in uſe, for carding waſte Silk, equally well as by hand; to be produced, together with a ſpecimen of the Cardings, on or before the firſt Tueſday in November, 1783; the gold medal, or twenty pounds.

157. WEAVING FISHING NETS. For the beſt ſpecimen of plain netting, for Fiſhing Nets, not leſs than twenty yards long, and ſix feet deep, woven in a loom,

or

or other machine; to be produced to the Society on or before the ſecond Tueſday in January, 1784; twenty guineas.

N. B. It is expected that the ſpecimen produced be made in ſuch a manner, as to be cut and joined without more loſs than uſual, that it have ſuch a plain ſelvage as the common fiſhing nets, and that the knot be equally faſt with thoſe in nets in common uſe, and as eaſily repaired.

158. PAPER FOR COPPER PLATES. To the perſon who ſhall eſtabliſh in England or Wales, a manufacture of paper, equal to the paper imported from France, proper for receiving impreſſions from mezzotinto, and other engraved copper-plates, and produce to the Society one ream, of the dimenſions of the French *ſuper-royal*, on or before the firſt Tueſday in January, 1784; the gold medal, or twenty guineas.

CERTIFICATES muſt be produced to the ſatisfaction of the Society, that the paper was made in England or Wales.

The thanks of the Society were given to Thomas Butterworth Bailey, of Hope, near Mancheſter, Eſq. for his obliging communication of the following Letters from Lady Moira, and the Specimens of Cloth made from the refuſe of Flax, and backings of Tow, according to the proceſs practiſed by her Ladyſhip, 1775.

SIR,

I had the pleaſure of your letter yeſterday by Doctor Halliday. Lord Moira and I, with much ſatisfaction, deſire to be both ranked as ſubſcribers to the Sylva, which is to be republiſhed by Doctor Hunter, whoſe Georgical Eſſays have been greatly admired beneath this roof.

As to the factitious cotton I have attempted to introduce the uſe of, I flatter myſelf that it is beginning to anſwer that purpoſe I had at heart, ſome alleviation to the miſeries of the unhappy beings

that

that ſurround me, the exceſs of poverty that reigns here being ſuch, that in my native land I am perſuaded it would not be imagined to exiſt. The very refuſe of the flax, which is called the backings of tow, produces a material that can be manufactured into a coarſe but comfortable clothing of the fuſtian and cotton kind, and this kind of cotton was offered to me laſt week for ſale, at three-pence per pound; it is therefore plain how little pains and expenſe the manufacturing of it coſts. Wool is here almoſt conſtantly ſixteen-pence a pound, often dearer. The wife makes and ſpins the cotton, the weaver adds a few more yards of warp to the piece of linen he has in his loom for ſale, and clothes his family with little more coſt than his own induſtry. It muſt appear to you that this manufacture is however beſt calculated for Ireland, where the conſumption of flax muſt conſequently leave ſuch quantities of refuſe; for tow

and

and the backings are all I employ, except fired or mildewed flax, both of which (from being ill-flaked) being improper for the linen cloth, I have made uſe of; hemp will alſo produce a ſort of cotton, but it requires infinitely more boiling, and bears a nearer reſemblance to wool. It was the codilla that I tried; the backings of that come amazingly cheap, and I believe it will take a better dye than flax.

The main purport in view ſeemed to me, the diveſting the flax of its oil. I tried ſoap boiler's lye with very good ſucceſs, ſcowering it afterwards to take off any bad effects of the lime uſed therein. I then had it tried to be ſcoured like wool, but found it required that the fermented urine in that caſe ſhould not be mixed with water, and that kelp and common ſalt were neceſſary to be added to it. Either of theſe methods do. The boiling of it might, I am ſure, be expedited,

dited, by having a cover to the iron pot, which might keep in the ſteam; and care muſt be taken, as the liquor diminiſhes, to repleniſh it conſtantly. I have boiled ſome in a mixture of lime water and ſalt; this had a harſhneſs in it that more reſembles the criſpneſs of cotton, but the ſcowering of it would certainly deprive it of that quality, and leaving the lime in, it is confidently aſſerted here, would rot it. I own I doubt that effect, as I imagine that lime, after it is ſlacked by water, no longer retains its corroſive quality. In India and China they uſe it in their waſhing of linen as regularly as we do ſoap.

The tow is heckled and boiled in ſmall faggots, tied up by a thread or bit of tow. The backings are carded in thin flakes, rolled up likewiſe, and tied. After boiling, they open in the ſame flakes they were carded into, and are waſhed out, and laid to whiten in that form. I ſend

you,

you, however, a ſample of the backings of white flax, that was only boiled four hours, and never laid down to whiten. In the courſe of this ſhort proceſs, you will ſee that the materials of which ſacking is made, is conſiderably mended, though I think it wants another hour's boiling, and that a week's whitening would have taken off that harſhneſs of the flax it ſtill in ſome degree poſſeſſes. It requires being beat, or put into a preſs, before it is carded on cotton cards, to ſeparate the fibres, which ſeem to be ſet at liberty from each other, by a diſſolution of ſome reſinous ſubſtance in the flax, at the ſame time that the oil of that plant is converted into a kind of ſoap. When I mention white flax, I do it in oppoſition to that, which being ſteeped in the bags, has the appellation of blay; this getting a tincture from the heath, has its colour rather fixt than diſcharged, by being made into cotton. You enquire into the reſult

of

of my purſuits concerning fixing laſting tinctures on linen. The tedious ſickneſs, and at length death, of a friend, kept my mind for many months this ſummer, in a ſituation of langour that is a total enemy to the buſy occupations of curioſity, and when I reſolved to engage myſelf therein, to keep off unavailing reflections, I found it too late for many herbs I had ſet down in a liſt, and that a plat of weld I had planted the autumn before, had never come up. I then employed myſelf with the purple fiſh found on the Newcaſtle ſhore. They anſwered all the ſmaller experiments mentioned by Reaumur and Templeman, but thoſe Dr. Holland has given, in his tranſlation of Pliny, the naturaliſt, they in no degree correſponded to; with all the boiling in lead and ſalt preſcribed by him, they only produced a very ill-looking ſoap. Though there appears no doubt but the purple wilk found here is the buccinum of the antients, it how-

ever

ever appeared to me that it was probable they got their colour from ſome moſs they fed upon. It could not be the archil, which (as I am told) grows much higher on the rocks than where they lie. I therefore employed a perſon to ſearch about the places in which the wilks or buccina lie, and to get me ſome of the moſs and ſea-weeds that grew near them. My ſmall collection is but juſt arrived, and I have not had time as yet to try whether my conjecture is true or falſe. To the purple yielded by the archil, I owed my ſuſpicion, that there might be other moſſes that would produce ſtronger and more permanent dyes. I was trying this morning the ſolution of tin I got from you, and find it as good as the firſt day. I ſhall take ſome of my cotton, finely ſpun, to Dublin, that it may receive the advantage of being manufactured by a ſkilful artiſt in the loom, and I hope ſoon to ſend you a ſample of it, when properly

perly wove, that may do it credit. Almoſt all I have had wove here has been of the coarſe kind, and that by weavers who never had ſeen cotton.

I am, Sir,

With great eſteem and regard,

Your faithful humble ſervant,

E. MOIRA.

Specimens of the flax prepared by Lady Moira, and of various ſtuffs manufactured from it, are preſerved in the Society's Repoſitory.

When I received, Sir, the favour of your laſt letter, I daily expected returning to theſe mountains, and from that expectation poſtponed acknowledging it, thinking that this place would yield me more leiſure than my engagements in town then afforded me. Had I foreſeen that my

ſtay would have been extended to the time it was, I ſhould not have been guilty of that neglect. Since my arrival here, an opportunity has not occurred for my ſending a packet before the preſent one, and it is now eleven o'clock at night, when I am informed a meſſenger is to be ſent off at five in the morning to Belfaſt. I have no reaſon to be vain of the ſamples I have ſent you; they merely ſhew, that the material of flax cotton, in able hands, will bear manufacturing, though it is my ill fortune to have it diſcredited by the artiſans who work for me. I had in Dublin, with great difficulty, a gown wove for myſelf, and three waiſtcoats, but had not the perſon who employed a weaver for me, particularly wiſhed to oblige me, I could not have got it accompliſhed; and the getting ſpun an ounce of this cotton in Dublin, I found impracticable; the abſurd alarm that it might injure the trade of foreign cotton, had gained ground, and the ſpinners, for what

reaſon

reaſon I cannot comprehend, declared themſelves ſuch bitter enemies to my ſcheme, that they would not ſpin for me. Such is my fate, that what between party in the metropolis, and indolence in this place, I am not capable of doing my ſcheme juſtice. That it ſhould ever injure the trade of foreign cotton, is impoſſible; though long accuſtomed to behold ſhoes and ſtockings looked upon, in this part of the world, by the generality, as quite unneceſſary, yet I cannot think but ſome apparel is requiſite; and as the price of wool is ſo high, and the poverty of the people ſo great, I did wiſh to introduce amongſt them that invention, which I ſaw might be greatly improved, and turn the refuſe of flax into comfortable clothing, and by a proceſs ſo eaſy, that every induſtrious wife and children might prepare it; and thoſe who are ſuppoſed to adopt this clothing, are ſuch as would never think of manufacturing foreign cotton for themſelves and fami-

lies. I ſend you a ſample, Sir, of the backings made into cotton, which you ſee might be manufactured into no bad clothing, and backings of tow being ſold to me, at the deareſt time, at one penny per pound, it is rating it high to ſay, that at two pence per pound a perſon might have it ready to ſpin. All the patterns I ſend you are of webs now in uſe, and thoſe I have given away, or that have been worn in my own family, have worn exceeding well; I ſhould except the ſmall pattern of pluſh, which was only a few quills that were thrown in at the end of a piece of worſted pluſh, to ſee what pile it would produce. My gown is wove in imitation of a kind of India muſlin, and the thread you will ſee muſt have been ſtrong from the breadth, which is full yard and half wide. I muſt beg your acceptance of a waiſtcoat, a very poor imitation indeed of Mancheſter ingenuity, but the finer ſpun cotton was uſed in my gown; and as I have already told you, Sir, that I had a

quantity

quantity of cotton in town, I intend immediately ſetting to work, but all in coarſe and cheap manufactures, ſuch as may benefit and ſuit the loweſt claſſes of life; the rich meriting as little to be conſidered in my ſcheme of manufactures, from that capriciouſneſs that generally attends them, as they are to be the objects of much attention, in any ſcheme that is to extend its influence to the moſt numerous part of Society.

I am, Sir,

Your much obliged,

And faithful humble ſervant,

Montalto, Ballynahynch,
July 31, 1775.

E. MOIRA.

Several ſpecimens of the above mentioned manufactured tow, are reſerved in the Society's Repoſitory.

Premiums for Inventions in Mechanicks.

159. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society, a cheap and portable Tranſit Inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſes of finding the latitudes and longitudes of places, and ſuperior to any now in uſe; the gold medal; to be produced on or before the laſt Tueſday in January, 1784.

160. GUN HARPOON. For every Whale taken by means of the Gun Harpoon; to the perſon who firſt ſtrikes ſuch fiſh therewith; two guineas.

N. B. Proper Certificates of the taking ſuch Whales, in the year 1783, ſigned by the maſter, or by the mate, when the claim is made by the maſter; to be

delivered

delivered to the Society on or before the laſt Tueſday in December, 1783.

161. GUN FOR THROWING HARPOONS. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Gun for throwing Harpoons, ſo as to render it more manageable than thoſe at preſent in uſe; the ſilver medal, or ten guineas.

To be delivered to the Society on or before the firſt Tueſday in December, 1783.

162. HARPOON TO BE THROWN BY A GUN. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Harpoon to be thrown by a gun; the Harpoon to be ſo contrived, that it may ſtrike and hold the fiſh with more certainty and greater effect than any hitherto made uſe of; the ſilver medal, or ten guineas.

To be delivered to the Society on or before the firſt Tueſday in December, 1783.

163. MACHINE FOR TRANSPORTING TIMBER. To the perſon who ſhall produce to the Society a model of the beſt, moſt ſimple, and cheap Machine or Carriage for tranſporting Timber, or other heavy Materials, on ſoft or clayey roads, at the leaſt expenſe; to be ſent in on or before the laſt Tueſday in November, 1783; twenty guineas.

164. IMPROVEMENT OF THE HAND VENTILATOR. To the perſon who ſhall produce to the Society, on or before the laſt Tueſday in February, 1784, a portable Ventilator, to be worked by hand, better adapted and more efficacious for extracting foul air from goals, priſons, and ſhips, than any now known or in uſe; the gold medal.

165. ARCHI-

165. ARCHIMEDEAN OR WATER SCREWS. To the perſon who ſhall produce to the Society, the moſt ſatisfactory account or proof, either by model or otherwiſe, of the mean helical angles of Archimedean or Water Screws, which ſhall raiſe the greateſt quantity of water by a given power, under the reſpective elevation of 30, 45, and 60 degrees of the whole machine: together with the proportion of the diameter of the ſhaft, to that of the whole internal diameter of the ſcrew, and what part of the whole diameter of the lower end of the ſcrew ſhould be immerſed in the water; the gold medal.

To be produced on or before the third Tueſday in February, 1784.

166. ENGINE FOR WORKING LOOMS. To the perſon who ſhall invent and conſtruct an Engine, for the purpoſe of working at one time, the greateſt number of looms, not fewer than three, for weaving ſilk, woollen, linen,

or

or cotton goods (equally well, and more expeditiouſly than by hand, or by any other method now in uſe) each piece to be not leſs than half a yard wide; the gold medal, or thirty guineas.

CERTIFICATES of the working ſuch Engine, with ſamples, not leſs than one yard long, to be produced on or before the firſt Tueſday in January, 1784.

167. CRANES FOR WHARFS. To the perſon who ſhall invent and produce to the Society, a model of a Crane for Wharfs, on a ſcale of not leſs than one inch to a foot, the conſtruction to be ſuch, that the power may be varied in a ſimple manner, according to the weight to be raiſed, and by which a greater weight ſhall be lifted by a given power through a like ſpace, than by any at preſent in uſe; the gold medal, or twenty guineas.

To be produced on or before the firſt Tueſday in February, 1784.

N. B.

N. B. The model ſhould neither be of the walking wheel, nor capſtan kind.

168. CARRIAGE TO CONVEY ENGINES FOR EXTINGUISHING FIRES. To the perſon who ſhall invent and produce to the Society a Machine or Carriage for conveying Engines for extinguiſhing Fires with greater eaſe and ſafety than any now in uſe, and from which they may be delivered in the moſt perfect ſtate for working; the gold medal.

To be produced on or before the laſt Tueſday in January, 1784.

A Bounty

A Bounty of Twenty Guineas was given to Mr. Spalding, of Edinburgh, for his improvement on the Diving Bell, 1776.

A relation of ſome attempts made with the Diving Bell, conſtructed on a ſmall ſcale, but on the ſame principles with that of Doctor Halley, during part of the ſummer, and autumn of 1775, with the propoſed improvements.

I beg leave to be indulged in giving a ſhort account of the reaſons that firſt induced me to engage ſingly in this expenſive and hazardous enterprize.

Having a large concern in the cargo of the Peggy, Thomas Boſwell, Maſter, from London for Leith, with a very full and valuable loading; this veſſel, with two large ſhips belonging to Newcaſtle and Shields, were, in a ſevere ſtorm, wrecked on the Scares, or Fern Iſlands, in the night of the 3d, or morning of the 4th of December, 1774, where all the crew and paſſengers periſhed; the light goods thrown

on

on ſhore from Sunderland Point, to Holy Iſland, gave the firſt intelligence of our loſs.

At ſeveral meetings of the traders, I was unanimouſly requeſted to take the management of this buſineſs, and collect what could be recovered of the cargo and veſſel. This, to the utmoſt of my power, at that ſevere ſeaſon of the year, I performed, but never found any part of my own property.

On this occaſion the utility of Doctor Halley's Diving Bell occurred to me in the ſtrongeſt manner, particularly as I thought I had diſcovered the place where it might reaſonably be preſumed the bottom of our veſſel lay, depreſſed in the water by the heavy goods uſually ſtowed in the lower tiers.

At my return to Edinburgh, I conſulted every author I could find, on the ſubject of diving, and the Diving Bell, and in June laſt made repeated trials in the roads of Leith, in various depths of five,

ſix, and eight fathoms water, making ſeveral alterations which experience ſuggeſted.

My apparatus being in tolerable order, I ſailed for Dunbar, thirty miles diſtant, in an open long-boat, ſloop rigged, about ſix or eight tons burthen, where, by a miſtaken account, I was informed the bottom of the Fox ſhip of war lay; but on my arrival, the oldeſt ſeaman in the place could give me no intelligence, as that veſſel periſhed in the night, with all on board, ſomewhere in Dunbar Bay, and by ſtorms, in ſo long a period as thirty years, was thought to be ſanded up. In order to gratify the curioſity of ſome friends there, I however determined to go down, where it might be thought probable her bottom lay; but in ſeven and eight fathoms water, found nothing but a fine hard ſandy bottom, from whence I am led to conjecture, that the proprietors of the valuable effects, which were on board that veſſel, might find their account in ſweeping for her. Now I was informed that a veſſel, which was thrown up by accident

dent in the river Tay, near Dundee, with a large quantity of iron, lay within two fathoms of the ſurface at low water; I determined to make trial there, and accordingly ſailed acroſs the Firth to that place, about fifteen leagues diſtant from Dunbar, having prevailed on my brother, and brother in law, to accompany me in all theſe expeditions, with two ſeamen, which were my whole crew.

At Dundee Mr. Knight and Mr. Leighton, the maſters of two veſſels, with a few ſeamen as aſſiſtants, ſailed out to the place on which it was conjectured, by the landmarks, this wreck lay; but at the ſame time they informed me, that the great quantities of ice in the winter of 1773, had either ſunk, or entirely deſtroyed, the remains of this veſſel; concerning which I was ſoon ſatisfied: for notwithſtanding the rapidity of the tides, I went down three different times, changing the ground at each going down. I fell in with a ſtump of the wreck, now ſunk five fathom deep

deep at low water, to a level with the ſoft bed of the river, which is compoſed of a light ſand intermixed with ſhells.

By the muddineſs of the river there is a darkneſs at only two fathoms from the ſurface, that cannot be deſcribed; from the ſmallneſs of the machine, which contained only forty-eight Engliſh gallons, it was impoſſible to make this attempt with a candle burning in it, which would conſume the air too quickly for any man to be able to work, and at the ſame time pay attention to receiving the neceſſary ſupplies of air, that important ſupport of life. Two days after we ſailed for Leith, where we happily arrived at four o'clock next morning. The trials I had hitherto made, were only preparatory to my views at the Scares, hoping that the experience I had acquired, would enable me to ſurmount the dangerous difficulty of the unequal rocky bottom I had to contend with there; but in the preceding trials and different alterations of the machinery, ſo much time

had

had been loſt, that I could not ſail for Bambrough before the firſt of September, the weather then being ſtormy, it was three days before I arrived there in my ſmall open boat, yet though ſo near the equinox, I was in hopes I ſhould ſtill have a few days of calm weather; but after many unſucceſsful attempts, could make no trial until the end of September.

This tedious and vexatious interval was greatly ſoftened by the kindneſs and hoſpitality of the Rev. Doctor Sharp, Archdeacon of Northumberland, his Lady and family at Bambrough Caſtle, whoſe friendly concern I will always remember with the ſincereſt gratitude.

Having at laſt ſome favourable weather, I ſailed to the Scares, with my brother and three ſailors I had brought with me from Leith, alſo two pilots from Bambrough and Warren.

By the calmneſs of the weather, it was four in the afternoon, about high water, before I could go down, at a ſmall diſ-

tance from the place where I judged the wreck to lie: the depth was about ten fathoms. I happily alighted on a flat part of the rock, within a ſmall ſpace of a dreadful chaſm, and had juſt gone two ſteps with my machine, when the terror of the two pilots was ſo great, that in ſpite of my brother they brought me up very precipitately, before I had in any degree examined around me; on coming into the boat, they remonſtrated on the danger of the machine being overturned, either on the wreck or the rocks, and alſo on the impoſſibility of raiſing any of the weighty goods with ſo ſmall a purchaſe, in an open boat; where at this ſeaſon no large veſſel would venture to lie, as the nights were now ſo long, and only two paſſages for a ſmall veſſel to run through, in caſe of a gale of eaſterly or ſoutherly wind: one of the paſſages extremely narrow, and both of them dangerous. As the tide now ran in the face of the rock we lay at, the pilots would not conſent to lie at anchor any longer; leſt

leſt wind and tide being both contrary, they ſhould not be able to conduct us ſafely through the iſlands before it was dark.

I was obliged to comply very unwillingly with their intreaties; though part of their aſſertions came too truly to paſs, for in ſailing home we cleared the rocks and iſlands with difficulty, but not before eleven o'clock at night, and even then with hard labour.

Convinced from this, that with an open boat nothing could be accompliſhed to purpoſe, and except in June and July, no man would riſk himſelf with me in a ſloop, to continue a few days and nights at anchor there; I was obliged to abandon this ultimate aim of all my attempts; yet though my boat was too ſmall to raiſe any great weight, I determined to take a view of the guns of a Dutch ſhip of war, loſt in the year 1704, and as they lay two or three miles nearer the land, I could execute this deſign with leſs difficulty, eſpe-

cially as the weather continued ſtill favourable. Having procured all intelligence poſſible, we went to the place, and being joined by Mr. Blacket, tackſman of the iſlands, his ſon, and ſeveral other brave fellows, my two pilots, though ſtill with me, having no ſtomach for the ſervice, I went down four different times, but could find no marks of any wreck, notwithſtanding my walking about in five and ſix fathoms water, as far as it was thought ſafe to allow rope to the bell; continuing generally twenty minutes or more each time, at the bottom. On this occaſion I was obliged to carry a cutting hook and knife, to clear away the ſea weeds, which at this place are very thick and ſtrong; without this method I could not move about. At the fifth going down, each trial being in a different place, I was agreeably ſurprized to find a large grove of tall weeds, all of them from ſix to eight feet high, with large tufted tops, moſtly growing in regular ranges, as far

far as the eye could reach; a variety of ſmall lobſters, and other ſhell fiſh ſwiming about in the intervals.

On a ſurvey of the ground, I found myſelf on the extremity of the place where the long-looked-for cannon lay, and one very large piece was nearly covered with round ſtones, thrown upon it by ſtorms from the ſouth eaſt; by the appearance and ſound, I judged it to be iron; but to form a more certain idea, I tried to pull up a ſtrong weed, expecting ſome part of the ruſt, if iron, would adhere to the fibres of the root, but my ſtrength was now exhauſted almoſt to faintneſs, by ſuch violent exertions in moving about during a ſpace of near three hours, yet ſtill I determined, if poſſible, to have this weed; I twiſted the buſhy top round one of the hooks at the mouth of the bell, on which part of the weight for ſinking the machine hung, then giving the ſignal, brought the weed along with me. To one ſide of the root

was faſtened a piece of rock, about ſeven pounds weight; in the middle a piece of decayed oak, very black, on the other ſide a black ſubſtance, which on a few hours expoſure to the air, changed into a dull reddiſh colour, reſembling crocus martis.

Preſſing buſineſs requiring me at home the Monday following, I ſet ſail for Leith; our compaſs being attracted by the great quantity of iron-work in my boat, we were, during the night, in the greateſt danger, being twice entangled amongſt the rocks, and very much chilled with the cold for want of proper cover; but eſcaping theſe dangers, we ſafely next morning arrived at Leith.

The propoſed alterations in conſtructing a Diving Bell to hold two perſons, which can be managed by a ſloop of one hundred tons, or a little under that burthen, are,

To

To have the machine on the common circular plan, able to contain two hundred gallons Engliſh, or a little more, with proper pullies within, by which the weights which bring it to the full ſinking degree, can be lowered down to the bottom; on pulling the rope fixed to this weight, the perſon or perſons in the bell can lower the machine to the bottom, or raiſe themſelves with the bell, ſo as to take in air from the barrels, as often as neceſſary; by the ſame method they may bring the bell to the ſurface, and the balancing weight can be taken in afterwards. The great and obvious importance of this alteration is, that the bell, as conſtructed formerly, could never be lowered ſafely with a man, on any wreck or rocky bottom; but, on the contrary, with the utmoſt hazard (till the ground was known) of being overturned; by the preſent amendment no danger can attend it: ſeamen, nay, even the moſt timid landſmen will, by this means, be ſoon brought to

uſe, with boldneſs an invention, which may be attended with great advantage to themſelves and country.

This machine alſo, in many places, can be uſed in the coldeſt weather, as the men in the bell have no occaſion to be above knee deep in water, for which high-topped water-tight boots, will be a ſufficient defence, and a thick flannel dreſs is preferable to every other.

Edinburgh,
15th Feb. 1776.

CHARLES SPALDING.

TO SAMUEL MORE, Eſq.

SIR,

I am favoured with your letter, requiring a drawing of the improvements propoſed on the Diving Bell, and my opinion how far the bell can be moved from the line of direction in which it goes down.

In

In anſwer to the firſt I have encloſed a drawing of the bell, to convey an idea of the principles of this improvement.

A bell of the ſize intended, will require from ſixteen to twenty hundred weight to ſink it; let one hundred of this weight be taken off, and near one foot of the upper part of the bell will float above water: if this hundred weight is again added, the bell ſinks with rapidity; nor is its deſcent affected by any current which does not exceed three knots an hour. I have gone down ſeveral times in a current of five knots, and felt very little deviation from the direct line.

The improvement conſiſts in a balancing weight of two and a half, or three hundred weight, ſuſpended from a hook fixed to the top of the inſide of the bell; this weight is raiſed or lowered by means of two double blocks, as in the figure, and determines the riſing or ſinking of the bell.

I beg

I beg to be underſtood as deſcribing a a bell wherein are two perſons, whoſe weight conſtitutes a part of that required for ſinking the machine, and who are provided with an adequate counterpoiſe to the want of their weight, when ſtanding on the ground at the bottom.

As to the other inquiry, "How far the "bell can be moved from the direction "in which it ſinks." This greatly depends on the nature of the bottom, the current, and depth of water; on a firm ſand, they may in ten fathoms water go from ſix to eight yards in a minute, and proportionably quicker in a leſſer depth, a full charge of air being taken in at bottom, previous to their moving.

In deep muddy clay, or ſoft ſandy ground, their progreſs muſt be aſſiſted by the motion of the balancing weight within; by a proper management of this weight, above one-fourth of the diameter at the mouth of the bell, can be gain-

ed

ed in a progreſſive motion, four times in a minute; and on an unequal rocky bottom, nearly the ſame, making allowance for the difficulty of aſcent and deſcent over the rocks.

When at a diſtance, horizontally from the veſſel from which the machine is let down, the motion of the bell muſt be followed by the long-boat, with ſmall air barrels and ſignal lines; this may be done in eaſy weather, to the diſtance of three hundred yards, or more, according to the ground and current, and the return of the bell to the veſſel may be aſſiſted by the long-boat, with a gentle motion.

I am, with the greateſt reſpect,

SIR,

Your moſt obedient humble ſervant,

Edinburgh,
12th April, 1776.

CHARLES SPALDING

EXPLA-

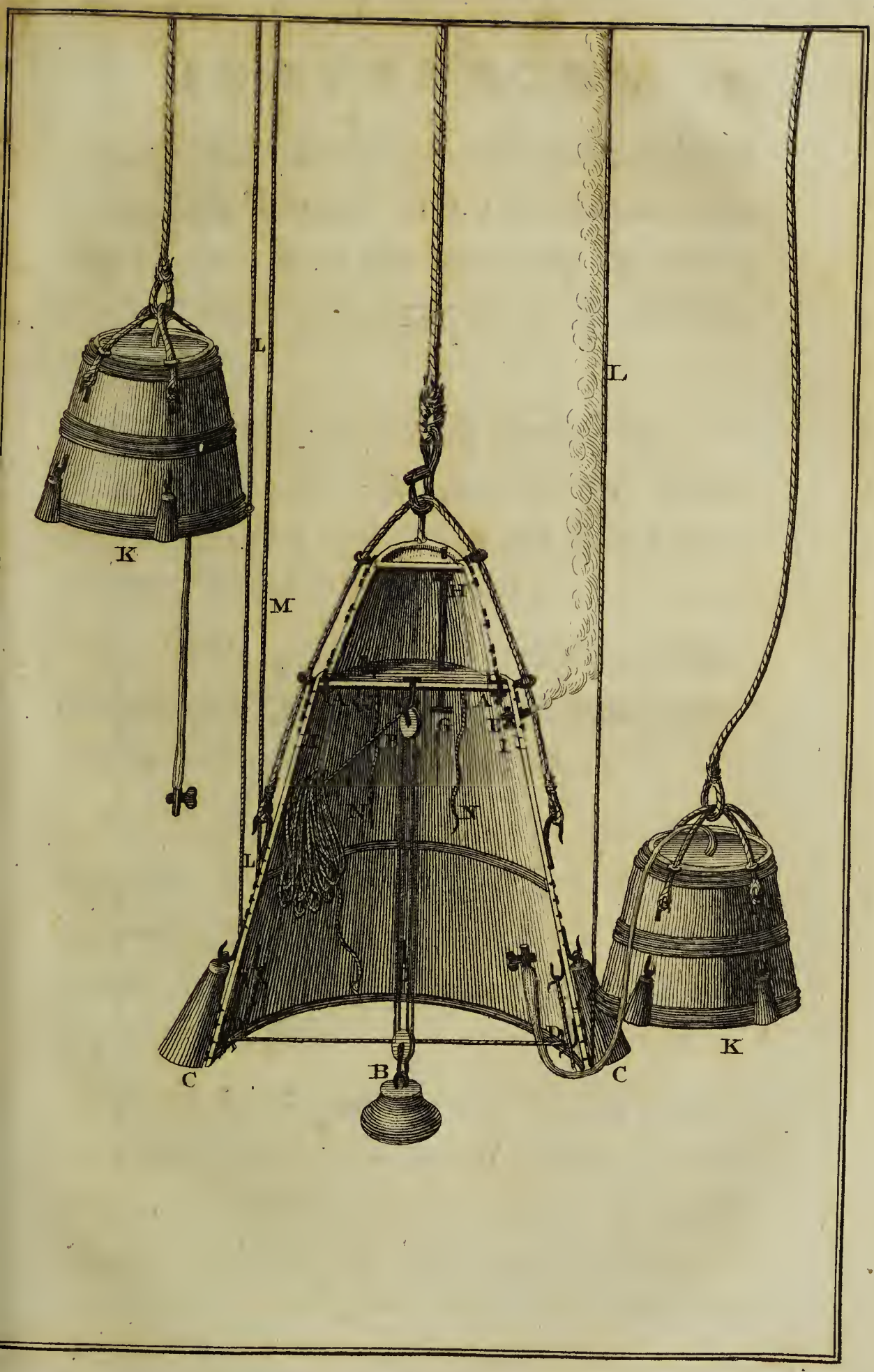
EXPLANATION of the PLATE,

Of the Diving Bell, as improved by Mr. Charles Spalding.

CAAC. The body of the bell, to be made of Pipe Staves, five feet long; diameter at bottom five feet; diameter at top two and a half feet.

AHA. The regulator or cap joined to the bell, by the ſcrews AA. ſo that an aperture is left between the top of the bell and the bottom of the cap, all round, except where theſe ſcrews join them; this contains about twenty-five wine gallons, and can be taken off from the bell occaſionally.

B. The balance weight with its pullies and rope. The weight is firſt let down to the bottom of the ſea, and by the action of the diver at the pulley rope, though he does not raiſe the weight, the bell deſcends;



SECTION

of Mr. Spalding's improved Diving Bell.

ſcends; the bell being loaded with weights C. in ſuch manner that the relative gravity of the whole machine may be nearly equal to the ſpecific gravity of the ſuſtaining fluid.

D. Hooks to which croſs ropes are faſtened, for the operator to reſt upon; ſeats round the bell being not only inconvenient, but even dangerous.

E. The common air cock for paſſing the phlogiſticated air from the bell, immediately into the external water.

F. Another air cock for filling the regulator with air from the bell, and conſequently expelling the water through the before-mentioned aperture, between the cap and the bell.

G. A handle within the bell to open an air cock H. at the top of the cap for diſcharging the air, whoſe place is immediately ſupplied by the water ruſhing in through

through the aperture between the cap and the bell, to reſtore the equilibrium.

I. Small windows.

K. Air veſſels, theſe veſſels being open below, are loaded with weights ſimilar to the bell, ſo that they deſcend through the water by their own gravity; in the top of each a leathern pipe is inſerted, with a cock on the other end. Theſe pipes communicate the air from the veſſels to the bell. They contain about forty wine gallons each, and are directed down to the bell by L, two lines joining to the bell, and the ſhip above.

M. The ſignal line.

N. Ropes-ends to be caught hold of in caſe of accidents.

Thirty Guineas, Part of the Premium offered for the Diſcovery of an Univerſal Standard of Weights or Meaſures, were voted to Mr. Thomas Hatton, who ſent in a Treatiſe, together with an Apparatus, under the Title of an Attempt to find, by Approximation, the Univerſal Standard required. 1779.

SUPPOSING a perſon in a future time, or in a place, when and where no exemplar of any meaſure may be had,

§. I. He directs the firſt approach to be made by a detached pendulum coarſely found, by tying together horſe-hairs (or other ſuch flexible material) equal in length to five ſpans (that are made between the thumb and the fourth finger of a middle ſized man) which will give a length to make a pendulum, with a ſtone of the ſize and ſhape of a hen's egg; then let him rectify this pendulum, by lengthening or ſhortening, till it may make ſixty vibrations

tions in the ſame time that an aſſiſtant counts ſeventy-two pulſations at the wriſt of an ordinary ſized man in health; when the length of the pendulum is adjudged to this meaſure of time, it will be ſufficiently accurate as a firſt apparatus, in order to proceed to the next approximation;

§. II. Which is by an apparatus conſiſting of two parts; the firſt and principal of which, is the aforeſaid pendulum ſuſpended from a braſs or metal poppet, called a cock, contrived to ſlide up and down in a groove made in a ſtrong ſolid board (fixed againſt a wall or poſt), and the flexible rod of the ſame pendulum paſſing through a hole in another poppet or cock fixed in the ſolid board, perpendicularly under, and parallel to the ſliding cock.

The other part of this apparatus, is a movement of the ſimpleſt kind, in form of a dial, ſufficient to keep the pendulum in vibration, and to keep a regiſter of its times if required.

The

Fig. I.

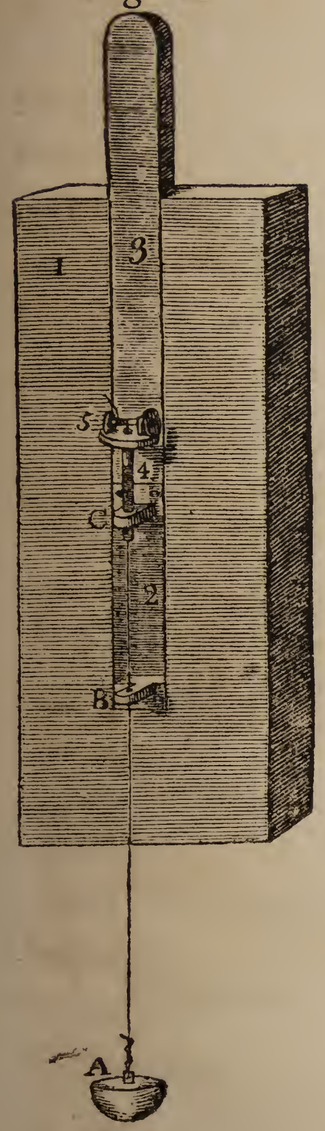


Fig. II.

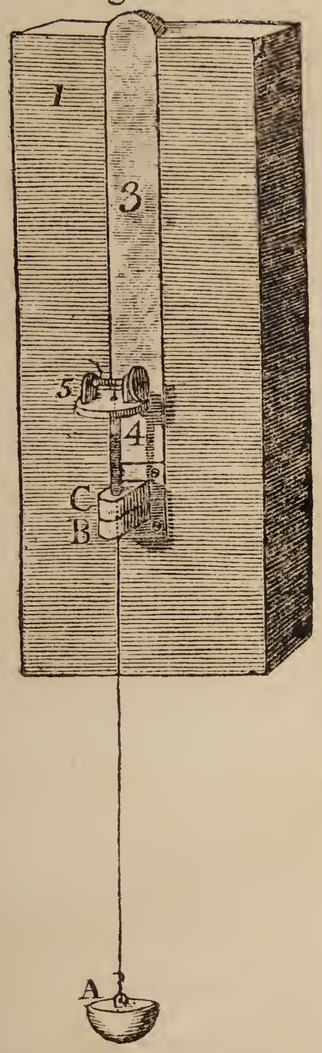


Fig. III.

EXPLANATION.

Fig. I. & II.

1. A ſtrong Board, fixed to a Wall, or Poſt.
2. A Groove cut perpendicularly in that Board.
3. A ſliding Slip of Board, moving up or down, in the Groove.
4. A fine Screw perforated; through which the Horſe-hair Rod of the Pendulum paſſes, and is faſtened at its Top to a Roller, (deſcribed in Fig. III.); which Screw ſerves to lengthen or ſhorten it in the moſt minute Degree, as explained in § 7.
5. A Roller, explained in Fig. III.

A. The Bob of the Pendulum.

B. A Poppet of Braſs, called a Cock, fixed to the ſtrong Board, and projecting forward, with a ſmall Hole in it capable of letting a Horſe-hair paſs through it. The Plane of this projecting Part is parallel to the Horizon.

C. A ſimilar Poppet, or Cock, fixed in the ſliding Slip with a like Projection, and perforated by a Female Screw, in which the Screw No. 4, works; and ſo ordered, that when the Slider is puſhed down, the two Cocks, and alſo the two Holes (being exactly oppoſite to each other) may be in cloſe Contact, and perfect Coincidence, without any vacant Space between them, as in Fig. II.

Now in Fig. II. let A B, $= x =$ the unknown Length of a Pendulum, which makes 21 Vibrations in 24 Seconds of true Time. And let B C $= d =$ the Diſtance between the two Cocks, which in Fig. II. is equal to nothing; but in Fig. I. is equal to the Difference in the Lengths of the longer and ſhorter Pendulum.

Then in Fig. I. let the Slider be lifted up till A B be ſhortened, and the Vibrations be thereby accelerated, ſo as to ſwing true Seconds. Let the Length of the Pendulum be ſtill unknown, but being compared with the firſt A B, which made 21 Vibrations in the ſame Space of Time that the latter made 24, the Difference in their Lengths will appear between the two Cocks B, and C, and this ſhorter Pendulum muſt be called A B $-$ B C, $= x - d$.

Fig. III. 6. A Roller fixed to a circular Braſs Plate, ſoldered to the Top of the perforated Screw, No. 4, to which Roller the End of the Horſe-hair is faſtened, and rolled up, or let out, as the Caſe may require, in order to adjuſt the longeſt Length of the Pendulum.

7. A Rub Wheel, to prevent the Roller from ſlipping, by rubbing againſt the Braſs Plate.

§. III. The particular uſe of the firſt part, in which the horſe-hair, or flexible rod of the pendulum is fixed in the upper or ſliding cock, and paſſes through the ſmall hole in the under or fixed cock (a hole juſt equal to the diameter of the horſe-hair) is to ſhew, demonſtratively, by the diſtance between the two cocks, the difference of length between any two pendulums, the numbers of whoſe vibrations are different within the ſame given time; as if one length makes only twenty-one vibrations, in the ſame ſpace of time that the other ſwings twenty-four ſeconds of true time; which difference this candidate ſuppoſes will always appear, by the diſtance between the two cocks, to be invariably the ſame in the ſame latitude, without making any inquiry into the real length of the pendulum in either caſe, or concerning the centers of oſcillation, or the point of ſuſpenſion from whence the movement begins; which laſt, however, muſt always be, in, or near, the bottom

of the lower cock. It is not neceſſary here to deſcribe the time-piece which this candidate has joined to this apparatus, though of a particular conſtruction, as its chief uſe is only to count the number of vibrations made in any given time.

§. IV. But ſuppoſing a minute, or other certain portion of true time, cannot be had by machines in uſe, at all times and in all places; he propoſes to divide the time of one apparent revolution of any fixed ſtar into twenty-one parts, by 75,600 vibrations of his pendulum; and again, by raiſing the ſliding-cock ſo as to ſhorten the pendulum, to divide the ſame ſpace of time into twenty-four parts or hours, by 86,400 vibrations; and ſuppoſing that the difference, between the two lengths of his pendulum in theſe two operations, in latitude 51 degrees 32 minutes, will appear by the diſtance or ſpace between his two cocks, to be always the ſame, he calls this diſtance or ſpace, a ſtandard foot for lati-

tude

tude 51 degrees 32 minutes; and aſſerts that this ſtandard foot, ſo obtained, is exactly the Britiſh foot now in uſe.

§. V. Here the candidate ſays, he might reſt the ſolution of the problem, if it be admitted that all nations in futurity may apply to, or have intercourſe with, the reſidents of latitude 51 degrees 32 minutes;—but if not, he has conſidered the variation in the lengths of pendulums, vibrating equal times in different latitudes from the equator to the pole, ariſing in conſequence of the ſpheroidal figure of the earth, according to our preſent philoſophy; and by an Algebraic theorem, with the calculations deduced from it, has ſhewn that the greateſt variation, in his ſtandard foot, taken at the equator, and in latitude 51 degrees 32 minutes, would be little more than the 20th part of a ſtandard inch, independent of the correction which he propoſes in the following ſection.

§. VI. He ſays he has found, that in two pendulums, one whereof ſwings true ſeconds, if the difference of their oſcillations does not exceed twenty ſeconds in the ſpace of twenty-four hours, the differences of their lengths will be equal all the world over.

FOR EXAMPLE.

If a pendulum of 39 $\frac{2}{10}$ ſtandard inches, be increaſed in its length by 1-60th part of an inch, its time will be varied by loſing twenty ſeconds of time in twenty-four hours.

§. VII. And he has ſhewn how to find theſe ſmall differences, by adapting ſcrews to his pendulums, and by making their ſeveral velocities (that is, their ſpiral threads), ſo that one turn of them ſhall vary the time only 20, 10, or 5 ſeconds reſpectively; the velocities of which ſcrews he finds to be at the rate of 60, 120, or 240 ſpiral threads in a ſtandard inch.

FOR

FOR EXAMPLE.

Suppoſe a meaſure, by a ſtrait ſtick, or by a rod of metal, be taken from between the two cocks of the inſtrument, as the length of the difference between two pendulums, one of which vibrated ſeconds of a day of 24 hours, or 86,400 ſeconds, and the other of a day of 21 nominal hours, or 75,600 ſeconds; and let this meaſure be divided into 12 equal parts:—Now to know whether thoſe parts are ſtandard inches of latitude 51 degrees 32 minutes, apply at the upper cock, where the end of the horſe-hair pendulum is fixed, a ſcrew, of the length of a 12th part of the aforeſaid difference or diſtance between the two cocks, which ſcrew ſhall be divided into 60 ſpiral threads; then adjuſt the pendulum to ſwing true ſeconds, at the rate of 86,400 ſeconds, in twenty-four hours; and afterwards ſhorten, or lengthen the pendulum, by one turn of

the ſcrew, or one 60th part of the ſuppoſed inch, (for the difference between ſhortening or lengthening in this infinitely ſmall dimenſion, is beyond the power of diſtinction, for the purpoſe of this experiment). Then he ſays, if the number of vibrations of this pendulum, in 24 hours, be either faſter or ſlower, (i. e. more or leſs) that 86,400 ſeconds, by the exact number of 20 ſeconds, the ſaid 12th part, or ſuppoſed inch of ſcrew applied at the upper cock, is exactly a ſtandard inch, and 12 ſuch inches a ſtandard foot, of the latitude 51 degrees, 32 minutes :—But if the difference, by ſhortening the pendulum by one turn of the ſcrew, ſhould be more than 20 ſeconds faſter, then the ſcrew muſt be cut coarſer, ſo that the number of threads in the ſuppoſed inch, may be made leſs than 60; or if the difference be leſs than 20 ſeconds faſter, then the ſcrew muſt be cut finer, ſo that the number of the threads in the ſuppoſed inch, may be more than 60;—and whatever number of threads the

ſaid

ſaid inch be divided into, ſo as, by one turn thereof, to make the exact difference of 20 ſeconds in the 24 hours, that number of threads muſt denote ſo many parts of 60, of the ſtandard inch of latitude 51 degrees 32 minutes: As, if the number of threads be 58, then the 12th part of the difference between theſe pendulums will be equal to 58 ſuch parts as that 60 of them will make the ſtandard inch;—or, if the number of threads ſhould be 62, then 60 of ſuch parts will make the ſtandard inch of latitude 51 degrees 32 minutes.

§. VIII. This candidate is more minute in his doctrine of the utility of theſe ſcrews, in taking accurate meaſures, than ſeems neceſſary for this abſtract:—And from the natural affinity between the vibrations of a balance and thoſe of a pendulum, he accompanied his apparatus with a balance beam, the arms of which are ſhortened or lengthened by ſcrews, in order to illuſtrate his method of correcting and aſcer-

taining the variations of pendulums in different latitudes.

§. IX. But he concludes, by ſaying, that if his approximation proves ſufficiently exact for making a ſtandard meaſure in latitude 51 degrees 32 minutes, then, in order to obviate an objection, which may be made againſt its univerſality, namely, that foreign nations may not have intercourſe with thoſe of latitude 51 degrees 32 minutes; he adds, that if the modern doctrine of the variation of pendulums in different latitudes be well founded, and that the knowledge of that doctrine may be preſerved to future and diſtant nations, then the ſtandard foot, of latitude 51 degrees 32 minutes, may be made univerſal, by adding or ſubtracting the difference by variation, between that and any other latitude; i. e. either between latitude 51 degrees 32 minutes, and the equator on one ſide, or between it and the pole on the other.

And

And that other ingenious perſons, in any part of the world, may be informed how to make experiments on the ſame principle, a more accurate deſcription and printed figures of the principal part of the apparatus are annexed, as preſented by the candidate, Mr. Thomas Hatton, Watch-maker and Scale-maker, at No. 5, Prujean-Square, near Ludgate-Hill, London.

A ſmall machine ſent by the candidate remains in the Repoſitory of the Society, for the inſpection of the ingenious.

Premiums

Premiums offered for the Advantage of the Britiſh Colonies.

169. NUTMEGS. For the greateſt quantity of merchantable nutmegs, not leſs than five pounds weight, being the growth of his majeſty's dominions in the Weſt-Indies, and nearly equal to thoſe imported from the iſlands of the Eaſt-Indies; the gold medal, or one hundred pounds.

Satisfactory Certificates from the governor, or lieutenant-governor, or ſome perſons of known credit, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on or before the firſt Tueſday in January, 1784.

170. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1785.

171, 172. BREAD

171, 172. BREAD FRUIT TREE. To the perſon or perſons, who between the firſt of June, and the fifteenth of Auguſt, 1784, ſhall bring into the port of London the greateſt number of plants of one or both ſpecies of the Bread Fruit Tree, in a growing ſtate, not leſs than three of either ſpecies; the gold medal.

173, 174. The ſame premiums are extended one year further; the plants to be brought into the port of London, between the firſt of June, and the fifteenth of Auguſt, 1785.

N. B. The plants which obtain the premiums are to be the property of the Society, to be diſpoſed of according to their diſcretion.

175. The Society being informed that a conſiderable quantity of oil can be obtained from the Seed of Cotton, and that after the expreſſion of the oil, the remaining cake will afford a ſtrong and hearty food for cattle; and likewiſe, that the apparatus

apparatus for the operation can be applied to the mill for ſugar canes, and worked in the rainy ſeaſon, at a moderate expenſe, have reſolved, for the foregoing reaſons, that the procuring oil from the Seed of Cotton is a proper object of a premium, conſidered as an encouragement for planters to extend the cultivation of Cotton, an article eſſentially requiſite to increaſe the manufacture of that commodity in this country.

The Society therefore offer as follows.

OIL FROM COTTON SEED.

To the planter in any of the Britiſh iſlands of the Weſt-Indies, who ſhall expreſs oil from the ſeed of Cotton, and make from the remaining ſeed hard and dry cakes, as food for cattle; the gold medal.

CERTIFICATES that not leſs than one ton of the oil has been expreſſed, and five hundred weight of the cakes obtained, to be produced to the Society, with two gal-

lons

lons of the oil, and two dozen of the cakes, together with a full account of the proceſs, on or before the laſt Tueſday in November, 1785.

For the next greateſt quantity, not leſs than half a ton of oil, and two hundred weight of the cakes; the ſilver medal.

The

The Gold Medal was given to Mr. Andrew Bennet, of Tobago, for the beſt Specimen of Weſt-India Cotton, and for the following Letter to his Correſpondent in London, containing an Account of his Experiments and Obſervations on ſeveral Species of Cotton, together with ſome Remarks on the Culture, 1778.

Tobago, July 2d, 1777.

Dear Sir,

I now ſit down to give you ſome account of the ſamples of Cotton I have prepared for you, and of the ſteps I have taken, from firſt to laſt, in order to find out and cultivate the beſt and moſt profitable ſort, that this valuable branch of commerce, ſo long neglected, might be brought to ſome tolerable degree of perfection; but as I am to give you a deſcription of ſeveral ſorts of Cotton, it may not be amiſs to premiſe, that a few ſorts of Cotton

Cotton are not only diſtinguiſhable from all others, but may be ranged into claſſes. Such are the Silk Cotton, the Vine Cotton, and what I ſhall call the Broad Lock. The Silk Cotton you muſt be, in ſome meaſure, acquainted with; there are perhaps twenty different ſorts of it, but they are all fine, more or leſs, and have a long ſtaple: the trees produce a prodigious number of pods, many of which contain four locks; the pods, the locks, and the ſeeds, are very ſmall; ſome of them have clean ſeeds, and may be ginned without much difficulty, if done with care; but moſt of them have foul moſſy ſeeds, which renders them hard to paſs through the gin; much of the moſs alſo rubs off in ginning, and mixes with the cotton. One ſort of the Silk Cotton is extremely fine and white, but the ſeed is entirely ſurrounded with green moſs, for which reaſon it is impoſſible to gin it; but it may be hand-picked with difficulty. I fancy this muſt be the ſort which came originally from Siam.

Siam. I prepared a parcel of the ſilk, and alſo a parcel of the kidney, or Braſilian Cotton, for the Society of Arts, two years ago; but on finding afterwards that their premium was confined to North-America, I ſold them to Meſſrs. Franklins, who ſent them to Mancheſter, where they were ſold for 2s. per lb. when the market price of common Cotton was 22d. per lb. They could not be afforded, picked ſo clean, for leſs than 3s. per lb. on account of the very ſmall quantity which a negroe can manage, and the trouble attending it. Not one ſort of them is worth cultivating, unleſs the manufacturer would give forty or fifty per cent. more for it than for common Cotton; yet I fancy that the ſilk is the St. Domingo Cotton, but am not certain. The Vine Cotton conſiſts of a great variety, perhaps forty or fifty different ſorts; but their characteriſtic is this: the cotton adheres only to the bottom, or round end of the ſeeds, for which reaſon it is the eaſieſt of all Cotton to gin; in general the trees

bear

bear a good number of pods, and rattoon well; the pods are rather ſmall than large. Some ſorts of the Vine Cotton are coarſe; moſt of them rather coarſe than fine; ſome rather fine than coarſe; and a few of them are really fine; but the locks of moſt of them are very apt to fall from the trees ſoon after the pods open, and ſome of them when open turn back, and preſent their inner ſides to the ſun, and then fall down and mingle with the dirt, whenever they are ſhook a little by the wind. The Broad Lock conſiſts of a moderate variety, and may be claſſed with as much propriety as the Silk or Vine Cotton, and for the ſame reaſon, having one mark common to the whole ſpecies, by which alſo they are diſtinguiſhable from every other ſort of Cotton. In general the pods are large, and ſome very large; the Cotton is fine, and ſome of them very fine; the Cotton adheres to ſeven-eighths of the ſurface of the ſeeds, which renders it proportionably hard to gin. However, the ſeeds are

clean or free from moſs, except that the points, or ſmall ends of the ſeeds of ſome ſorts, are covered with a little tuft of green or browniſh moſs, which partly rubs off in ginning. This tuft alſo prevents the ſeeds from opening in a kindly manner when put into the ground, and occaſions them to rot. The ſeeds of ſome other ſorts that are not fine, have alſo this tuft, and conſequently it can be no mark of the fineneſs of Cotton; yet novices will judge of the goodneſs of Cotton by this mark, and ſpeak of it as a certain ſign with ſome confidence. The circumſtance by which the Broad Lock is diſtinguiſhed from all others, and which pointed out this name as the moſt proper, is this: when the pod opens, the locks do not hang down like the locks of other Cotton, but ſtick to the ſide of the pod, and ſpread out broad, and get looſe from it gradually as it grows dry; but even then the ends of the locks ſtick to the bottom of the pod, and the pod will remain open eight or ten days before

before the locks begin to fall. I now proceed to give you what I may call the hiſtory of the ſeveral ſorts of Cotton, or ſome relation of what I have done, in order to find out the beſt and moſt profitable ſorts of Cotton, &c. I came to this iſland in the year 1770; the following year, my land being cleared, I planted ſome Cotton ſeed which was ſent down from Barbadoes. In 1772 I examined the Cotton as it opened on the trees, and was ſurprized to find ſo great a variety among it, and eſpecially ſo many bad ſorts: I imagined that the perſon who ſent it down muſt have collected it from all the Cotton eſtates in that iſland; and could hardly think otherwiſe, till I got ſome ſeed from Cariaçou, and found nearly as great a variety among that alſo. It appeared evident to me, though a ſtranger to the buſineſs, that it was capable of great improvement. Being fond of experiments, I began with picking Cotton from a tree which bore large pods; I

planted the ſeeds, and got a tolerable crop in 1773. The trees being cut down, and the ground cleaned, I had the mortification to find they did not thrive a fifth part as well as the other trees, which were much neglected. Thus, by my firſt experiment, I loſt ſeveral hundred pounds of cotton in 1774, when cotton firſt bore a good price; but I learnt from this, and other circumſtances, that ſome ſorts of Cotton did not rattoon or ſtool ſo well as others. How aſtoniſhing is it, thought I, that the Cotton planters ſhould, even to this day, pay ſo little attention to their buſineſs, and remain ſo profoundly ignorant of Cotton; that they ſhould cultivate ſo many bad, indifferent, and unprofitable ſorts with the good; that not one man ſhould be found in all our iſlands, who has taſte and curioſity enough to make himſelf maſter of the buſineſs, and to ſelect the beſt and moſt profitable ſorts, and reject all the others. Such were my reflections at that time, but perhaps they were

were too ſevere; the reaſons are now obvious, and the difficulties many more, and much greater than I could then conceive; the loſs above-mentioned, however, did not deter me from making the trials. Having gained a little knowledge, I was now determined to exert myſelf, and endeavour to find out and cultivate the beſt and moſt profitable ſorts. I was told, however, that the beſt would not fetch a better price than the common ſorts. This was a diſcouraging circumſtance, but being animated by an ardent wiſh for the flouriſhing ſtate of Britiſh manufactures, I began in 1774, with examining almoſt every Cotton tree on my land. Not content with this, I collected ſome ſeeds from the beſt I could find on the neighbouring eſtates. I alſo bought a ſmall parcel of ſeed Cotton, and examined almoſt every lock, the ſeeds of which I ſorted and planted in ſeveral places, each ſort by itſelf, at laſt I found the part of a lock which had five ſeeds in it; theſe ſeeds

were very foul and moſſy, but the Cotton appeared to be excellent. I planted them near my houſe, and gave them every advantage they could receive from ſoil and culture. The trees yielded well in 1775. I found the Cotton hard to gin, but being urged on by a kind of enthuſiaſm, to bring this article of commerce to the greateſt degree of perfection I poſſibly could, I was hardy enough to plant ſeven or eight acres with this bad ſeed, the trees of which laſt year yielded but a ſcanty crop, and a greater proportion of theſe trees died after they were cut down, than of any other ſort in my land, (the Braſilian or Kidney Cotton trees only excepted): on account of the difficulty of ginning it, and the ſcanty crop, I reſolved to plant no more of it; and it alſo appeared unneceſſary, ſince from the ſeveral collections made the two preceding years, I had got other ſorts nearly equal in goodneſs, and much eaſier to gin, but this is the ſort which I call the Green Moſs, of which I ſend you

you a ſample of 10lb. weight, for the Society of Arts, and alſo 10lb. weight, or more, of the Kidney, or Braſilian Cotton, in order to gain the gold medal. In 1775, I examined the ſeveral ſelect ſorts planted the year before, but none pleaſed me ſo well as the green moſs; ſtill aiming at perfection, I ſearched for all the beſt ſorts I could find, not forgetting to connect the planter's intereſt with the perfection of the manufacture. In my ſearch from day to day, I found one ſort which bore a prodigious large pod, ninety of which, on an average, and eighty of the largeſt, weigh one pound. This, from its ſize, and ſtaring and rough appearance, I call the Bull's Head. I was tranſported with the diſcovery. You undoubtedly wiſh for a ſample of it. You have it, No. 4. B. H. It is not fine, but perhaps may paſs for middling common Cotton. You will let me know what the connoiſſeurs think of it; it ſeems too valuable to be rejected, though I doubt if it will be ſo valuable

on the whole as the Broad Lock. About the ſame time I found another ſort, which bore a large pod, one hundred and ten of which weigh one pound; this is called Guava Cotton, you have a ſample of it in No. 3. G. C. I have planted the ſeeds of both ſorts twice, and have found the number of pods on a tree, to be nearly in proportion to their ſize: and it remains a doubt with me to this day, whether thoſe ſorts which grow in a large pod, or the beſt of thoſe which grow in a ſmall or middling one, yield the greateſt quantity of Cotton, on the whole. I have this year picked ſixty-ſix ounces of good, and ſix or ſeven of damaged Cotton, from one tree, three years old, that bears but middling pods, not leſs than one hundred and forty of which are a pound weight: hearing a great deal about the ſtaple of Cotton, and being told that Cotton which had a good ſtaple, was better than a finer ſort with an inferior one, I reſolved to look out for all that had the beſt ſtaple, as far as I could

could judge of it in the lock, not regarding any other circumſtance, except that I would not chooſe a coarſe ſort; in this collection, as in every other, I was obliged to examine fifty or one hundred different ſorts, before I could find one to pleaſe me. However, I collected from time to time, nineteen different ſorts of this kind, the ſeeds of which I planted in nineteen rows, each ſort in a row, but am not altogether pleaſed with it, as might be expected; ſome of them are too hard to gin, and ſome not fine enough. I was not then well acquainted with the Broad Lock, as a diſtinct claſs or ſpecies, but I now find two of that ſort among them, and they are ſome of the beſt; you have a ſample of it in the bag marked No. 19. C. Number nineteen is the name of it; my fine Cotton conſiſts of the Green Moſs, the Broad Lock, and Number Nineteen. You will naturally obſerve how much trouble I muſt have taken, from firſt to laſt, in collecting all theſe different ſorts, which

can

can only be done in crop time, and particularly how much of it might have been ſaved, if I had been happy enough to have had with me a perfect maſter of the buſineſs, to guide me in my choice; but this moſt agreeable amuſement was laborious and fatiguing to me, chiefly on account of my conſtant bad ſtate of health. Still urged on by the ſame anxiety as before, I laboured hard laſt year in queſt of a more perfect ſort than I then poſſeſſed. After a great deal of fruitleſs ſearch, I at laſt found one ſort, which bore a very long pod, the locks very looſe, and drew out to an uncommon length, like the Silk Cotton; the tree had but a few pods then remaining on it, but I ſaved and planted the ſeeds, and am much pleaſed with the Cotton; it is not very eaſy to gin; I called it the Long Pod. Upon the whole, I prefer No. 1 and 2, to any others of the fine Cotton. I have this year collected ſome of the beſt of thoſe ſorts, which are eaſy to gin; you may expect ſamples of them

next year, but I find that entire perfection in this matter ſeems to be unattainable; what further diſcoveries may do is uncertain. I have hitherto gained ſome new inſight every year, and ſee clearly that there is a hundred times more to be learned about Cotton, than its planters imagine; but I fancy I have nearly got to the *ne plus ultra*, and expect nothing more than ſome little improvements on the diſcoveries already made; the ſamples are marked thus: Kidney or Braſilian, No. 1. Green Moſs, No. 2. For the Society of Arts.

I am, dear Sir,

With great eſteem,

Your moſt obedient humble ſervant,

(Signed) ANDREW BENNET.

To —— ——, Eſq.
London.

GENERAL

GENERAL CONDITIONS.

Notwithſtanding the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any premium as the performance ſhall be adjudged to deſerve, or of with-holding the whole, if there be no merit; yet the Candidates may be aſſured, the Society will always judge liberally of their ſeveral claims.

It is required, that the matters for which premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each claimant thinks fit, ſuch claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the claimant's name and addreſs.

No papers ſhall be opened, but ſuch as ſhall gain premiums, unleſs where it appears to the Society abſolutely neceſſary for

for the determination of the claim: all the reſt ſhall be returned unopened, with the matters to which they belong, if inquired after by their marks within two years; after which time, if not demanded, they ſhall be publickly burnt, unopened, at ſome meeting of the Society.

All models of machines, which obtain premiums or bounties, for the future, ſhall be the property of the Society.

All the premiums of this Society are deſigned for that part of Great Britain, called England, the dominion of Wales, and the town of Berwick upon Tweed, unleſs expreſsly mentioned to the contrary.

The claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No perſon ſhall receive any premium, bounty, or encouragement from the Society, for any matter for which he has obtained,

obtained, or propoſes to obtain, a patent.

A candidate for a premium, or a perſon applying for a bounty, being detected in any diſingenuous method to impoſe on the Society, ſhall forfeit ſuch premium or bounty, and be deemed incapable of obtaining any for the future.

The performances which each year obtain premiums or bounties, are to remain with the Society until the end of May, except as mentioned in the conditions annexed to the premiums offered for promoting the Polite Arts.

No member of this Society ſhall be a candidate for, or intitled to receive any premium, bounty, or reward whatſoever, except the honorary medal of this Society.

Where Certificates are required to be produced in claim of premiums, they ſhould be expreſſed as nearly as poſſible in the words of the reſpective advertiſements,

and

and ſhould not be from the candidate, (ſolely) but from ſome other perſon, or perſons, who have a poſitive knowledge of the facts certified.

Where premiums, or bounties, are obtained, in conſequence of ſpecimens produced, the Society mean to retain ſuch part as they may judge neceſſary, making a reaſonable allowance for the ſame.

No Candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's rooms, after they have delivered in their claims, till ſuch claims are adjudged, unleſs ſummoned by the Committee.

By order of the Society,

SAMUEL MORE, Secretary.

N. B. Any information or advice that may forward the deſigns of this Society for

for the public good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. More, the Secretary, at the Society's office, in the Adelphi Buildings, London.

*** In caſe any perſon ſhould be inclinable to leave a ſum of money to this Society by will; the following form is offered for that purpoſe:

Item, I give and bequeath unto A. B. and C. D. the ſum of upon condition, and to the intent, that they, or one of them, do pay the ſame to the Collector for the time being, of a Society in London, who now call themſelves the Society for the Encouragement of Arts, Manufactures, and Commerce; which ſaid ſum of I will, and deſire may be paid out of my perſonal eſtate, and applied towards carrying on the laudable deſigns of the ſaid Society.

Premiums

Premiums adjudged in conſequence of the Advertiſements in 1782.

Claſs 138, Honorary Premiums. To the Honourable Miſs Catharine Southwell, Spring Gardens, for a Drawing; the Gold Medal.

Claſs 139, Honorary Premiums. To the Honourable Miſs Caroline Walpole, Spring Gardens; the Silver Medal.

Claſs 143, Honorary Drawings. To Miſs Emma Jane Greenland, Newman-Street, Oxford-Street, for a Drawing; the Gold Medal.

Claſs 144, Honorary Drawings. To Miſs Smith, Great George-Street, Weſtminſter, for a Drawing; the Silver Medal.

145. Drawings of Landſcapes. To Mr. Guy Head, Snow-Hill, firſt premium; the greater Silver Pallet.

147. Hiſtorical Drawings. To Mr. William Artaud, No. 26, Villers-Street, York-Buildings; the greater Silver Pallet.

129. Drawings of Portraits. To Mr. Charles Ralph Hurter, No. 53, Great Marlborough-Street; a Silver Medallion.

N. B. Mr. Stock's premium.

130. Drawings of Outlines. To Mr. Thomas Stewart, Union-Street, New-Bond-Street; firſt premium; the greater Silver Pallet.

131. Drawings of Outlines. To Miſs Catherine Charlotte Raper, Chelſea; the leſſer Silver Pallet.

139. Drawings of Flowers. To Miſs Leonora De Yongh, of Old-Ford; the greater Silver Pallet.

MECHANICKS.

Claſs 173, One Wheel Chaiſe. To Mr. Richard Ford, of Birmingham, for the beſt Single Wheel Chaiſe; the Gold Medal.

Bounties

Bounties and Preſents in 1782.

To Mr. Richard Winſor, of Totneſs, Devon, for a method of Preventing Ruſt in Wheat; the Silver Medal.

To Mr. Thomas Stewart, Union-Street, New Bond-Street; for a Drawing of a Landſcape; the leſſer Silver Pallet.

To Miſs Engliſh, of Shooter's-Hill, for a Drawing of a Landſcape; the Silver Medal.

To Miſs Cook, of Everton, near Bawtry, for a Drawing of Coniſbro' Caſtle, Yorkſhire; the leſſer Silver Pallet, gilt.

RULES AND ORDERS.

Extract of ſuch Rules and Orders as explain the Order of the Proceedings of the Society, Admiſſion of Members, &c.

Of the Officers, and Manner of their Election.

THERE ſhall be one Preſident, twelve Vice-Preſidents, a Secretary, an Aſſiſtant Secretary, a Regiſter, and a Collector of the ſubſcription-money; which officers ſhall be elected by ballot, on the firſt Tueſday in March, annually: and on that day no other buſineſs ſhall be tranſacted.

Meetings of the Society.

There ſhall be four general meetings every year, in the great room of the Society, at ſix of the clock in the evening preciſely;

preciſely; viz. on the third Wedneſday in April, the ſecond Wedneſday in May, the ſecond Wedneſday in November, and the ſecond Wedneſday in December.

The ordinary meetings of the Society ſhall be held on Wedneſday in every week, at ſix of the clock in the evening preciſely, from the fourth Wedneſday in October, to the firſt Wedneſday in June; and from the firſt Wedneſday in June, to the fourth Wedneſday in October, there ſhall be no meeting of the Society, unleſs called by the Preſident, or two Vice-Preſidents, on extraordinary occaſions.

Election of Members.

No perſon is to be propoſed for a member, unleſs recommended by three members; and the name, place of abode, and addition of the perſon recommended, ſhall be delivered in, ſigned by the propoſers, which ſhall be read by the Secretary, who ſhall inſert the name in the liſt of candidates,

didates, to be hung up in the Society and committee rooms, until the next meeting of the Society, at which ſuch perſons ſhall be ballotted for, provided there be ſeven days between the meetings; and if two-thirds of the members then voting ſhall ballot in his favour, he ſhall be deemed a perpetual member, upon payment of twenty guineas at one payment; or a ſubſcribing member, upon payment of any ſum, not leſs than two guineas annually.

In election of members, a ſecond ballot ſhall be granted, if immediately demanded.

Foreigners, or perſons who do not reſide in Great-Britain, may be elected, by ballot, correſponding members of this Society, without being ſubject to any annual payment; and ſhall be admitted to the meetings and committees of the Society, during their reſidence here, provided ſuch reſidence does not exceed three months

months at one time; but ſhall not be permitted to vote.

No member, or correſponding member of this Society, ſhall be a candidate for, or entitled to receive, any premium, bounty, or reward, except the honorary medals of the Society. The Society requeſt their correſponding members, as often as ſhall be convenient, to favour them with accounts of ſuch uſeful diſcoveries, or improvements, in any of the polite or œconomical arts, as may come to their knowledge.

Every perſon, upon his election, is to pay his ſubſcription-money, or one of the members is at liberty to make the depoſit in his name, in caſe of abſence.

Every member ſhall pay his ſubſcription-money in arrear, within one month after he has been applied to by letter from the Collector for that purpoſe, and no perſon ſhall be intitled to debate, or vote, at

any meeting or committee, until his ſubſcription for the current year, and all arrears are paid: and no perſon ſhall be entitled to be preſent at any meeting or committee, whoſe ſubſcription ſhall be at any time for two full years in arrear. Yet as ſeveral who have declined continuing their ſubſcriptions for a time, may be again deſirous of becoming members, but by the foregoing rule and order ſeem to be precluded, until their arrears ſhall be diſcharged; it is hereby ordered that any ſuch perſon ſhall be capable of being re-elected a member of the Society, in the ſame manner, and on the ſame terms, as if he had never been a member before.

The names of ſuch perſons as have not paid their firſt ſubſcription-money, are to be omitted in the liſt of members.

Of Committees.

In order that every member may be the better informed of the times of the meetings

ings of the ſeveral committees: in general caſes, they are fixed in the following manner:

Committees of correſpondence and agriculture, on Monday.

Colonies and trade, and manufactures, on Tueſday.

Mechanicks, on Thurſday.

Polite arts, on Friday.

Chemiſtry, on Saturday.

Accompts, in the firſt week in every month.

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**Hugh, Duke of Northumberland, F.R.S.
**Jacob, P. Earl of Radnor
**Hugh, Earl Percy
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P Sir George Auguſtus Eliott, K.B.
* Edward Hooper, Eſq. F.R.S.
* Owen Saluſbury Brereton, Eſq. F.R. and A.S.
* Joſhua Steele, Eſq.
* James Daviſon, Eſq.

SECRETARY.

Mr. Samuel More

ASSISTANT SECRETARY.

Mr. Richard Samuel

REGISTER.

Mr. George Cockings

COLLECTOR.

A

LIST

OF

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As well as of thoſe who are two full Years in Arrear.

N. B. Thoſe marked with ** pay Five Guineas annually; thoſe marked with * Three Guineas annually, and thoſe with P are Perpetual Members.

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Adair Alexander, Eſq. Agent, *Pall-Mall*
Adam James, Eſq. *Adelphi-Buildings*
Adam Robert, Eſq. F.R.S. *Ditto*
Adam William, Eſq. *Ditto*
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Agace Mr. Zachariah, *Lawrence-lane, Cheapſide*
Aguilar Honourable Ephraim Baron, *Broad-ſtreet Buildings*
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Allen Thomas, Eſq. *Bridgwater*

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Arrow Mr. James, Builder, *Rocheſter-row, Weſtminſter*

P Aſhby Shukbrugh, Eſq. F.R.S. *Great Ormond-ſtreet*

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Aſhmore Mr. Thomas, Stock-Broker, *Ely-place, Holborn*

Aſſer Mr. James, Surveyor, No. 11, *Southampton-buildings*

P Aubert Alexander, Eſq. *Auſtin-friars*

Auriol Mr. James, No. 17, *Chancery-lane*

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P Buchan, Earl of, L.L.D. F.R. and A.S.

Briſtol, Earl of, *St. James's-ſquare*

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Burdett Sir Robert, Bart. *Harley-ſtreet, Cavendiſh-ſquare*

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Burrow Mr. Reuben, *Eaſt-Indies*

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C

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**Cavendiſh, Lord George

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Cavendiſh Honourable Henry, F.R.S. *Marlborough-ſtreet*

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P Colepeper John Spencer, Eſq.

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Collinſon Thomas, Eſq.

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Dollond Mr. John, Optician, *Ditto*

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Friere Cyprian Ribeyro, Eſq.

Fuller William, Eſq. *New-road, Southwark*

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P Greville Honourable Charles

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Griffin General Sir John Griffin, K.B. *New Burlington-ſtreet*

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Greſley William, Eſq. *Elm-court, Temple*

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Grigby Joſhua, Eſq. *Drinkwater, neary Bury, Suffolk*

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Grignion Mr. Thomas, jun. Watch-Maker, *Ditto*

* Groſvenor Thomas, Eſq. *Cavendiſh-ſquare*

Grote Andrew, Eſq. Banker, *Threadneedle-ſtreet*

Groves Mr. John, Bricklayer to his Majeſty, *Millbank*

Gullet Chriſtopher, *Exeter, Devonſhire*

H

**Hardwicke Philip, Earl of, F.R.S.

P Hillſborough Wills, Earl of, F.R.S.

Hampden Robert Lord Viſcount, F.R. and A.S.

Herries Sir Robert, Kt. *St. James's-ſquare*

P Hume Sir Abraham, Bart. *Wormleybury, Herts*

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P Hagen Mr. Jacob, *Dockhead, Southwark*

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Hanbury Oſgood, Eſq. *Tower-ſtreet*

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Hollis Timothy, Eſq. *Great Ormond-ſtreet*

* Hooper Edward, Eſq. V.P. F.R.S. *Hertford-ſtreet*

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P Howard John, Eſq. F.R.S. *Cardington, Bedfordſhire*

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P Jamineau Iſaac, Eſq.

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Jarman Nathaniel, Eſq. Sugar-Refiner, *Diſtaff-lane*

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Jones Mr. William, Chemiſt, *Ruſſel-ſtreet- Covent-garden*

K

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Kaye Rev. Richard, Sub-almoner to his Majeſty, L.L.D. F.R. and A.S.

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Lock William, Eſq. *Upper Brook-ſtreet*

Long Beeſton, Eſq. *Biſhopſgate-ſtreet*

Lovell Michael, Eſq. Merchant, *Mark-lane*

Lowndes William, Eſq. *Scotland-yard, Whitehall*

Lucas Bartholomew, Eſq. No. 45, *Ludgate-hill*

M

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Murray, the Honourable Lieutenant General, James, *Beauport, Suſſex*

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Middleton Sir Charles, Bart. *Hertford-ſtreet, May-fair*

Macham William, L.L.D. *Doctor's-commons*

Macky Robert, Eſq. *Queen-ſtreet, Cheapſide*

Mackreth Robert, Eſq. *Cork-ſtreet*

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Malcolm Mr. William, Nurſeryman, *Kenington*

Martin James, Eſq. *Lombard-ſtreet*

Martin Mr. Thomas, Watch-Maker, *Cornhill*

Maſefield Mr. Richard, Paper-Stainer, *Strand*

Maſkens Mr. Adrian, Picture-Frame Warehouſe, *Compton-ſtreet, Soho*

P. Maſon Rev. William, *Curzon-ſtreet*

Maſſey Mr. William, Maſter of the Academy, *Fenchurch-ſtreet*

Mathew Job, Eſq. *Laytonſtone, Eſſex*

**Methuen Paul, Eſq. *Lower Groſvenor-ſtreet*

Meyrick John, Eſq. *Parliament-ſtreet*

Michie Jonathan, Eſq. *Craven-ſtreet, Strand*

Mildred Mr. Daniel, Banker, *Lombard-ſtreet*

Millington Mr. Thomas, Attorney, *George-ſtreet, Hanover-ſquare*

Mills Mr. Benjamin, *Middle Moorfields*

Miniſh Mr. William, Sal-Ammoniac-Maker, *Whitechapel*

Monkhouſe Mr. George, No. 35, *St. Swithin's-lane*

Monro John, M.D. *Bedford-ſquare*

* Montagu Mrs. Elizabeth, *Portman-ſquare*

Moore Mr. Thomas, Manufacturer, *Chiſwell-ſtreet*

Mortimer Thomas, Eſq.

Moſer Mr. John, Ironmonger, *Berwick-ſtreet*

Mucklow Horace, Eſq. *Iſlington*

P. Muilman Peter, Eſq. *King-ſtreet, Covent-garden*

N

P. Norfolk Charles, Duke of, F.R.S.

**Newcaſtle Henry, Duke of, F.R.S.

**Northumberland Hugh, Duke of, V.P. F.R.S.

North, Frederick Lord

Nairne Mr. Edward, Optician, *Cornhill*

Newman Reverend Charles, *Cloiſters*

P. Newton Andrew, Eſq. *Cecil-ſtreet, Strand*

Nickalls Mr. Joſeph, Engineer, *Southwark*

O

Ogilvie Scroope, Eſq. at Mr. Adair's, *Pall-Mall*

Ord John, Eſq. *Lincoln's-Inn-fields*

Oſborne Iſaac, Eſq. *Lawrence-Poultney-hill*

Oſorio Mr. Abraham, jun. Merchant, *Throgmorton-ſtreet*

P. Oſwald James, Eſq. *Albermarle-ſtreet*

Oſwald Richard, Eſq. *Philpot-lane*

Owen Reverend John, *Laytonſtone, Eſſex*

P

**Portland William Henry, Duke of, F.R.S.

P. Plymouth Otho, Earl of

**Percy, Earl, V.P.

Palk, Sir Robert, Bart, *Bruton-ſtreet*

* Pocock Sir George, K. B. Admiral of the Blue, *Charles-ſtreet, Berkley-ſquare*

P. Paice Mr. Joſeph, *Queen-ſtreet, Cheapſide*

Parker Mr. William, Glaſs Manufacturer, *Fleet-ſtreet*

Payne Mr. Samuel, Malt Diſtiller, *Vauxhall*

P Perrin William Philip, Eſq. *Bloomſbury-ſquare*

Perry John, Eſq. *Blackwall*

Phillips Mr. Samuel, Engineer to his Majeſty's Board of Ordnance, *St. George's-Road, Black-friars-bridge*

Phillips Mr. James, Printer, *George-yard, Lombard-ſtreet*

P. Pinfold Charles, Eſq. L.L.D.

P. Potter Chriſtopher, Eſq.

Potter George, Eſq. *St. Andrew's-court, Holborn*

Powney Henry, Eſq. *Tooke's-court*

P. Prado Samuel, Eſq.

Pratt John, Eſq. *Lower Brook-ſtreet*

Q

Quarme Robert, Eſq. *Scotland-yard*

**Richmond Charles, Duke of, V.P. F.R.S.

**Radnor Jacob Pleydell, Earl of, V.P. F.R.S.

**Romney Robert Lord, Preſident, L.L.D. F.R. and A.S.

P Rocheſter John Lord, Biſhop of

Ridley Sir Matthew White, Bart. *Charles-ſtreet, Berkley-ſquare*

Raby Alexander, Eſq. *Cobham, Surrey*

Rainforth Mr. Samſon, Tallow-Chandler, *Clare-ſtreet, Clare-market*

P. Ramey John, Eſq. Barriſter at Law, *Ormeſby, Norfolk*

Ramſbottom Mr. John, Diſtiller, *Alderſgate-ſtreet*

Ramſbottom Mr. Richard, Diſtiller, *Ditto*

Ramus William, Eſq. *St. James's*

Reade John Tyſoe, Eſq. Banker, *Lombard-ſtreet*

Reeves Richard, Eſq. *Scotland-yard*

Reveley Henry, Eſq. *Old Bond-ſtreet*

Reynardſon Samuel, Eſq. F.R.S. *Great Ormond-ſtreet*

Richmond Nathaniel, Eſq. *Bryanſton-ſtreet, Portman-ſquare*

Rigg Mr. John, jun. Merchant, No. 59, *Mark-lane*

Remmington Mr. John, Silkman, *Milk-ſtreet, Cheapſide*

Rodes Cornelius Heathcote, Eſq. *Balborough, Derby-ſhire*

Rodney James, Eſq. *Soho-ſquare*

Rondeau James, Eſq. *Savage-gardens*

Roſs George, Eſq. *Conduit-ſtreet*

Ruſſell Joſeph, Eſq. *Sergeant's-Inn, Fleet-ſtreet.*

S

Sandwich John, Earl of

**Spencer John, Earl of

P. Stanhope Philip, Earl of, F.R.S.

P. Scarſdale Nathaniel, Lord

P. Surry Charles, Earl of, F.R. and A.S.

Sewell, Right Honourable Sir Thomas, Kt. Maſter of the Rolls

**Savile Sir George, Bart. V.P. F.R.S.

* St. Aubyn Sir John, Bart. *Old Bond-ſtreet*

P. Salvador Joſeph, Eſq. F.R.S.

Samborſki the Reverend Andrew, *Clifford-ſtreet*

Samuel Mr. John, *Foſter-lane, Cheapſide*

Savage Thomas, M.D. *Conduit-ſtreet*

Sayer Henry, Eſq. *Lincoln's-Inn*

Scott William, L.L.D. *Doctor's-commons*

Scott George, Eſq. *Thavie's-Inn, Holborn*

P. Selwyn Mr. Thomas

Serra Mr. Iſaac, Merchant, *Greville-ſtreet, Hatton-garden*

Seward William, Eſq. F.R.S. *Maddox-ſtreet*

P. Shakeſpear Mr. George, Builder, *Oxford-road*

Sharpe William, Eſq. F.R.S. Surgeon, *Old-jewry*

Sheldon Mr. Thomas, Surgeon, *Tottenham-court-road*

P. Shipley Mr. William, Gent. *Maidſtone, Kent*

P. Shore Samuel, jun. Eſq. *James-ſtreet, Weſtminſter*

P. Skottow Nicholas, Eſq. *Berner's-ſtreet*

Small Mr. Alexander, Surgeon, *Great Ruſſell-ſtreet*

Smirnove Reverend James, *Ruſſian Chapel, Clifford-ſtreet*

* Smith George, Eſq. No. 29, *Berner-ſtreet*

Smith William, Eſq. *Swithin's-lane, Cannon-ſtreet*

Smith Mr. Charles, Linen-Draper, *Conduit-ſtreet*

Smith Mr. John, Merchant, *Lad-lane*

Snaith Mr. Thomas, Malt-Diſtiller, *Vauxhall*

Songa Anthony, Eſq. Merchant, *Copthall-court, Throg-morton-ſtreet*

Stanier Mr. Richard, Mancheſter-Warehouſe, *Cannon-ſtreet*

* Steele Joſhua, Eſq. V.P. *Barbadoes*

Stephens Philip, Eſq. F.R.S. *Admiralty*

Stone Richard, Eſq. *Swithin's-lane*

Storer Thomas, Eſq. *Golden-ſquare*

Strachan James, Eſq. *Mincing-lane*

Strettel John, Eſq. Weſt-India-Merchant, *Lime-ſtreet*

Strutt Mr. Jedediah, Hoſier, *Derby*

Summers Henry, Eſq. *Ironmonger's-hall*

Sutton Captain John, *Robert-ſtreet, Adelphi*

T

Turner Sir Charles, Bart. *Davis-ſtreet, Berkley-ſquare*

Taylor Mr. William, Merchant, No. 66, *Cheapſide*

Teixera Abraham David, Eſq. *Leadenhall-ſtreet*

Thompſon Andrew, Eſq. *Auſtin-friars*

P. Thornton John, Eſq. *Clapham*

P. Thornton Samuel, Eſq. *Ditto*

Thurſton Framingham, Eſq. *Weſton-market, Suffolk*

Towry George Phillips, Eſq. *Ingleſield-green, Surry*

Trenchard John, Eſq. *Wimpole-ſtreet*

Tryon General William, *Upper Groſvenor-ſtreet*

P. Tunſtall Marmaduke, Eſq. F.R. and A.S. *Welbeck-ſtreet*

Tyers Thomas, Eſq. *Figtree-court, Temple*

V

P. Valencia Richard Lord Viſcount

P. Verney Ralph Earl, F.R.S.

Vernon George Venables Lord, *Park-place*

Valle John, Eſq. Conſul from *Venice*, No. 9, *Throg-morton-ſtreet*

Vaughan Mr. George, Laceman, *Strand*

Vaughan Mr. William, Merchant, *Mincing-lane*

Vetch Mr. John

W

P. Warwick George, Earl of, F.R. and A.S.

P. Winterton Edward, Earl of, F.R.S.

P. Widrington Henry Lord

P. Wentworth Sir Thomas, Bart.

* Walpole Honourable Horatio, F.R. and A.S.

* Williams Sir Edward, Bart.

P. Webb Sir John, Bart.

Walford Mr. Thomas, Manufacturer, *St. John's-ſquare, Clerkenwell*

Walker Mr. John, Wholeſale Linen-Draper, *Cornhill*

Waller Charles, Eſq. *Strand*

Waller William, Eſq. *Coney-court, Gray's-Inn*

Ward Mr. John, Architect

P. Waring Richard Hill, Eſq. F.R.S. *Inner-temple*

Watſon William, M.D. F.R.S. *Lincoln's-inn-fields*

Waugh Mr. Joſeph, Dry-Salter, *Dowgate-hill*

Weſton Robert, Eſq. F.R. and A.S. *Norfolk-ſtreet*

Whitbread Samuel, Eſq. *Chiſwell-ſtreet*

White Thomas, Eſq. *Retford, Nottinghamſhire*

White Mr. William, Tallow-Chandler, *Garlick-hill*

Whitefoord Caleb, Eſq. Wine-Merchant, *Craven-ſtreet, Strand*

Whitehead George, Eſq. Banker, *Baſinghall-ſtreet*

P. Whitfield Henry Fotherby, Eſq. *Rickmanſworth, Herts*

Wilkinſon Montague, Eſq. *Little-Brookham, Surry*

Wilkinſon Mr. John, Architect, *Store-ſtreet, Tottenham-court-road*

Wilkinſon John, Eſq. *Broſeley, Shropſhire*

P. Willes Francis, Eſq. *Queen-ſtreet, May-fair*

Willet Ralph, Eſq. F.R. and A.S. *Dean-ſtreet, Soho*

Willis William, Eſq. Banker, *Lombard-ſtreet*

Wilmot Henry, Eſq. *Bloomſbury-ſquare*

Wilſon Mr. William, Coal-Merchant, *Bank-ſide, Southwark*

Wilſon Mr. Thomas, Haberdaſher, *Friday-ſtreet*

Wingfield John, Gent. *Carey-ſtreet*

P. Winne Captain Iſaac Laſcelles, at Mr. Murray's, *Philpot-lane, Fenchurch-ſtreet*

P. Wotton William Samuel, Eſq. No. 70, *Strand*

Wright Mayſon, Eſq. *Hull, Yorkſhire*

Wright Gregory, Eſq. *Terrace, Kenſington*

P. Wright Mr. Richard, Druggiſt, *Fenchurch-ſtreet*

Wyatt Mr. George, Surveyor, *Black-friars New-road*

Wyatt Thomas, Eſq. *Rowd, near Deviſes*, and No. 2, *Brick-court, Temple*

Wynne John, Eſq. *Fig-tree-court, Temple*
Wynne William, L.L.D. *Doctor's-Commons*

Y

Young Mr. Lake, Merchant, *Watling-ſtreet*
Young Arthur, Eſq. F.R.S. *Bradfield-hall, Suffolk*
Young John, Eſq. *Newman-ſtreet*

Z

P. Zachary John, Gent. F.R.S. *Airley, Worceſterſhire*
Zurhorſt Mr. Daniel, *Arundel-ſtreet*

A CATALOGUE OF THE MACHINES AND MODELS IN THE REPOSITORIES OF THE SOCIETY.

Which may be viewed and examined every Day (SUNDAYS and WEDNESDAYS excepted) by any Gentleman who ſhall apply to the Regiſter, at the Society's Houſe, in the Adelphi-Buildings, between the Hours of Eleven and Two.

CLASS I.

Machines and Models belonging to Agriculture.

I. A Model of a Machine for drying Madder, by Mr. George Rutt, 1763.

II. A Bee-box, preſented to the Society by Sir Charles Whitworth, Vice-Preſident, 1763.

 III. Two

III. Two Brabant Scythes, for reaping Corn, preſented to the Society by William Hanbury, Eſq.

IV. A Model of a Plough for turning up Heath Ground, by Mr. Ringroſe

V. A Model of a Thiſtle Cutter, by Mr. Ringroſe, March 16, 1763.

VI. A Land Roller, preſented to the Society by Mr. Scawen, of Carſhalton, Surry, 1761.

VII. A Model of a Plough, with ſix Shares and Coulters, by Robert Gee, 1767.

VIII. A Drain-Plough, by Mr. Cuthbert Clarke, 1767.

IX. A Drain-Plough by Mr. William Knowles, 1767.

X. A Drill-Plough, by M. De Chateau-vieux.

XI. A ſingle Cultivator, by ditto

XII. A double ditto, by ditto, 1765.

XIII. A Scarificator, preſented to the Society by Mr. John Winn, Baker, of Ireland, 1767.

XIV. A Drill-Plough, by the Rev. Mr. Gainſborough, 1766.

XV. A Drill-Plough by Mr. Willey, 1766.

XVI. A Drill-Plough, with Improvements, by ditto, 1767.

XVII. A Horſe-Hoe by the Reverend Mr. Hewit.

XVIII. Ditto, with a Harrow, by ditto

XIX. A Machine for winnowing Corn, by Mr. Evers.

XX. A Machine for dreſſing Flour, by ditto, 1761.

XXI. A Model of a Machine for dreſſing Wheat and Malt, by Mr. Mackell.

XXII. XXIII. A Cyder Mill and Preſs, by Mr. Charles Lloyd, 1761.

XXIV. A Machine for ſlicing Turneps, by Mr. Edghill, 1766.

XXV. A Perambulator for meaſuring Roads, by Richard Lovell Edgeworth, Eſq. 1767.

XXVI. A Model of a Field-Gate, by Mr. Thomas Orm, 1766.

XXVII. A Trenching-Plough, by Mr. Ducket.

XXVIII. A Three-Furrow Plough, by ditto, 1767.

XXIX. A Model of a Machine for threſhing Corn, by Mr. Evers, 1768.

XXX. A Model of a Machine for making cloſe Drills, by Mr. Beſtland, 1769.

XXXI. A Model of a temporary Barn, preſented to the Society by Richard Lovel Edgeworth, Eſq.

XXXII. A Drill Plough by Mr. Craik, 1770.

XXXIII. A Drill-Plough, preſented to the Society by Dr. Gale, 1770.

XXXIV. A covered Drain-Plough, by Mr. Makins, 1770.

XXXV. A Machine for cutting Straw, by Mr. William Bailey, 1770.

XXXVI. An Apparatus for deſtroying Inſects on Melon Beds, by Mr. Thomas Green, 1771.

XXXVII. A Plough, by Mr. Cuthbert Clarke, 1771.

XXXVIII. A Model of a Machine for levelling Land, by Mr. Chriſtopher Saverland, 1771.

XXXIX. A Plough with a Circular Coulter, by Matthew Peters, Eſq. 1772.

XL. A Spring and Index for aſcertaining the Force of the Draught in ploughing, invented by Mr. More, 1772.

XLI. A Machine for cutting Roots, by Nicholas Turner, Eſq. 1772.

XLII. A Drill-Plough, by Mr. Thomas Hope, 1773.

XLIII. An Iron Plough by Mr. Brand, 1773.

XLIV. A Machine for cutting Straw, by Mr. Stephen Smith, 1774.

XLV. A new invented Plough for mending Roads, by Mr. Chriſtopher Pinchbeck, 1774.

XLVI. A Model of a Scarificator, by Mr. Butler, o York, 1775.

XLVII. A Drill Plough, by Mr. Blanchard, 1775.

XLVIII. A Horſe-Hoe, by Richard Lloyd, Eſq.

XLIX. A Harrow, preſented by ditto

L. A Plough with three Shares, for ſtirring ſtubble Land, by Captain Hinde.

LI. A Scythe, by ditto.

LII. A Model of a Land Roller, preſented to the Society by Captain Hinde, 1775.

LIII. A Collar and Harneſs for a Bull

LIV. A Hand Drill by John Arbuthnot, Eſq. 1769.

LV. A Model of a Machine for preſerving Hay-Ricks from Rain during the making, by Mr. Richard Toft, 1778.

LVI. A Model of an Horſe-Hoe, by William Ilbert, Eſq. 1778.

LVII. A Maching for ſowing Turneps, by Sir William Fordyce, 1779.

LVIII. A Machine for ſlicing Turneps, by Mr. Kite, 1780.

LIX. Two new conſtructed Bee-Boxes, and two Bee-Hives, by Mr. Keys, 1782.

LX. A Tool for digging up, and cutting Turneps, by Mr. Winſor.

LXI. A Model of a Trenching Machine, by Mr. Robert Hayward, 1783.

LXII. A Model of a Drill for Beans, by Mr. Boys.

LXIII. A Model of a Drill for Wheat, by Mr. Boys.

CLASS II.

Machines and Implements belonging to Chemiſtry.

I. A Digeſter, by Mr. Creagh, 1762.

II. A portable Furnace, &c. by Dr. Lewis.

III. A Swivel-Gun, by Mr. John Bedford, 1776.

CLASS III.

Machines and Models belonging to Manufactures.

I. A New-invented Comb-Pot, by Mr. S. Hayward, 1763.

II. A Longſhed Spinning-Wheel, by Mr. Thomas Perrin, 1762.

III. A Spinning-Wheel, by Mr. John Webb, 1761.

IV. A Spinning-Wheel, by M. Thomas Perrin, 1761.

V. A Horizontal Spinning-Wheel, by Mr. William Harriſon, 1764.

VI. A Spinning-Wheel, by Mr. Perrin, 1765.

VII. A Spinning-Wheel, by Mr. Garrat, 1766.

VIII. A Spinning-Wheel, by Mr. Garrat, 1767.

IX. A Machine for Winding and Doubling Worſted, by Mr. Jeremiah Burrows, 1765.

X. A Machine for Winding and Doubling, by Mr. Crager, 1765.

XI. A Machine for Winding and Doubling, by Mr. Garrat, 1766.

XII. A Reel for Winding Silk from the Cocoons, by Mr. Verrier, 1762.

XIII. A Silk Reel, preſented to the Society, by John Pownall, Eſq.

XIV. A complete Frame and Reel to wind Silk, agreeable to the preſent beſt method of working in Italy.

XV. A Model of a Loom for Brocades, by Mr. Sebaſtian Favier, 1761.

XVI. A Stocking Frame, by Mr. Samuel Unwin, 1765.

XVII. A Stocking Frame, by Mr. Whyman, 1766.

XVIII. A Loom, by Mr. J. Almond, 1771.

XIX. A Maching for Doubling and Twifting, 1771.

XX. A Machine for Winding Balls of Thread, by Mr. John Powell, 1779.

CLASS IV.

Models of Mills, Cranes, Machines for raifing Water, Carriages, and other Machines and Implements, not reducible to any particular Claſs.

I. A Model of a Saw-Mill, by Mr. James Stainsfield, 1766.

II. A Hand-Mill, for grinding Corn, by Mr. John Gordon.

III. A Steel-Mill, for grinding Corn, by Mr. Peter Lyon, 1758.

IV. A Hand-Mill, by Mr. Samuel Parſons, 1758.

V. A Hand-Mill, by Mr. Charles Lloyd, 1761.

VI. A Hand-Mill, with Improvements, by Mr. William Bailey, made from one brought from St. Cas, by his Royal Highneſs the late Duke of York, 1760.

VII. A Model of a Windmill, by Mr. James Verrier, 1761.

VIII. A Model of a Windmill, by Mr. Lewis, 1761.

IX. A Model of a Machine for raiſing Water, by Mr. Merryman, 1766.

X. A Model of a Windmill, by Mr. Nickalls, 1760.

XI. A Model of a Windmill for draining Land, by Mr. Collier, 1758.

XII. Ditto by ditto, for the ſame purpoſe.

XIII. A Trough and Wheel, by ditto, more fully to explain No. XI.

XIV. A Model of a Tidemill, by the Rev. Mr. Gainſborough, 1761.

XV. A Model of a Tidemill, by Mr. Coulthard, 1762.

XVI. A Model of a Tidemill, by Mr. Nickalls, 1760.

XVII. A Model of a Machine for boring Auger Holes, by Mr. William Bailey, 1760.

XVIII. A Model of a Crane with three Powers, by Mr. James Ferguſon, 1762.

XIX. A Model of a Crane, by Mr. Samſon, 1765.

XX. A Lock, by Mr. Moore, 1763.

XXI. A Model of a Four-wheel Carriage, by Mr. Cotton, 1767.

XXII. A Model of a Four-wheel Carriage, by Meſſrs. Cranefield, 1765.

XXIII. The Implements uſed by the Dutch in the Turbot Fiſhery.

XXIV. A Model of a Four-wheel Fiſh Carriage, by Mr. Stephen Boult, 1762.

XXV. A Model of a Two-Wheel Fiſh Carriage, by ditto, 1762.

XXVI. A Model of a Two-wheel Fiſh Carriage, by Mr. Joachim Smith, 1762.

XXVII. Two Machines for trying Ships Blocks.

XXVIII. A Model of a Machine for raiſing Water, by Mr. Wirts, 1768.

XXIX. A Model of an Apparatus for ſaving the Lives of Men aboard of Ships, ſtranded on a Lee Shore, by Mr. John Winn, 1767.

XXX. A Compaſs and Protractor, by Mr. Aaron Miller, 1767.

XXXI. A Model of a Machine, for grinding and poliſhing Glaſs, by Mr. Jeremiah Burrows, 1767.

XXXII. An Expanding Rod for gauging Veſſels, by Mr. Efford, 1767.

XXXIII. A Pair of Door-hinges with ſpiral Springs, by Mr. Delevitz, 1768.

XXXIV. A Model of a Wheel Crane, by Mr. Pinchbeck, 1767.

XXXV. A Model, ſhewing by what means an alternate Motion may be made to produce a conſtant Rotation, by Keane Fitzgerald, Eſq. 1768.

XXXVI. A Model of a Machine Cart, by Mr. Black, 1767.

XXXVII. A Model of Dr. Hale's Ventilator, by Mr. Thomas Yeoman, 1768.

XXXVIII. A Model of a Machine for making Wheel-Tyre, by Mr. Hunt.

XXXIX. An Inſtrument for gauging Veſſels, by Mr. Efford, 1769.

XL. A Pair of new invented Coach Springs, by Mr. Jacob, 1769.

XLI. An Hydraulic Machine, by Mr. Weſtgarth, 1769.

XLII. An Iron Mill for grinding Corn, by Meſſrs. Freeth, 1769.

XLIII. A portable Iron Oven, by Mr. Clements, 1770.

XLIV. A Bolting-mill, by Mr. Nathaniel Stedman, 1770.

XLV. A Machine to teach Blind Perſons the Rules of Arithmetic, by Mr. Granville, 1770.

XLVI. A Bolting-mill, by Mr. Thomas Preſton, 1771.

XLVII. A Jack for the Uſe of Houſe and Ship-builders, by Mr. Abraham Staghold, 1771.

XLVIII. A Saſh Pulley, by Mr. Flower, 1771.

XLIX. A Worm Auger, by Mr. Phineas Cook, 1771.

L. An Index Balance, by Mr. Sebaſtian Clayſs, 1771.

LI. A Machine for bruiſing Oats and Malt, by Mr. Wilcox, 1771.

LII. A Breaſt Wimble, with Dr. Hook's univerſal Joint, by Mr. Delevitz, 1771.

LIII. A Model of a Wheel Carriage to turn in the leaſt Angle, by Mr. William Bailey, jun. 1772.

LIV. A Model of a new conſtructed Arch, by Mr. Arrow, 1772.

LV. A Machine for ſlicing Turneps, &c. by Nicholas Turner, Eſq. 1772.

LVI. A Machine to give an Alarm in caſe of Fire, by Meſſrs. Inols and Jewers, 1771.

LVII. A Gun Harpoon, by Mr. Abraham Staghold, 1772.

LVIII. A falling Hinge, by Mr. Gaſcoigne, 1773.

LIX. An Apparatus to prevent the ill Effects of Mercury in Water Gilding, by Mr. J. Hill, 1774.

LX. A Machine to cut Chips for Hats, by Mr. Galloway, 1775.

LXI. A Machine for weighing Gold Coin, by Mr. Matthew Hill, 1775.

LXII. A Model of a Machine to raiſe Ore, &c. by Mr. Hulman, 1775.

LXIII. A Gun and Harpoon, by Mr. Richard Gibſon, 1775.

LXIV. A Floating Light for ſaving the Lives of thoſe who fall overboard at Sea, by Mr. William Shipley, 1776.

LXV. A Model of a Poſt Coach, by Mr. John Hudſon, 1776.

LXVI. A Coach Brace, by Mr. Groce, 1776.

LXVII. A Model of an Apparatus for fiſhing up Goods from the Bottom of the Sea, by Mr. Frazer, 1776.

LXVIII. An Iron Frame for an Umbrella, by Mr. Mackenzie, 1776.

LXIX. A Model of a Perch Bolt, and of an Axle-Tree, by Mr. Hall, 1777.

LXX. A Model of a Packing Preſs, by Mr. Gilpin, 1777.

LXXI. A Machine for watering Gardens, by Meſſrs. Green and Gray, 1777.

LXXII. A Bolt for a Gate, by Mr. Friend, 1777.

LXXIII. A Machine for aſcertaining an univerſal Standard of Meaſure, by Mr. Thomas Hatton, 1779.

LXXIV. A Model of the York Indiaman, ſhewing the Method uſed to bring her up to Deptford, after having

been driven on Shore at Margate, by Mr. William Barnard, 1779.

LXXV. A Valve Water Cock, by Mr. John Holmes, 1780.

LXXVI. A Model of a new conſtructed Crank for Saw-Mills, &c. by Mr. John Foulds, 1780.

LXXVII. A Model, ſhewing the Method of raiſing Doors over Carpets, by Mr. John Harriſon, 1780.

LXXVIII. A Lock, by Mr. Thomas Cornthwaite, 1780.

LXXIX. A Model of a new conſtructed Roller, by Mr. Thomas Greenſtreet, 1781.

LXXX. An Inſtrument for taking the apparent Heights of Objects, and their Diſtances from each other, by Mr. Richard Samuel, 1782.

LXXXI. A Lock, by Mr. Thomas Cornthwaite, 1783.

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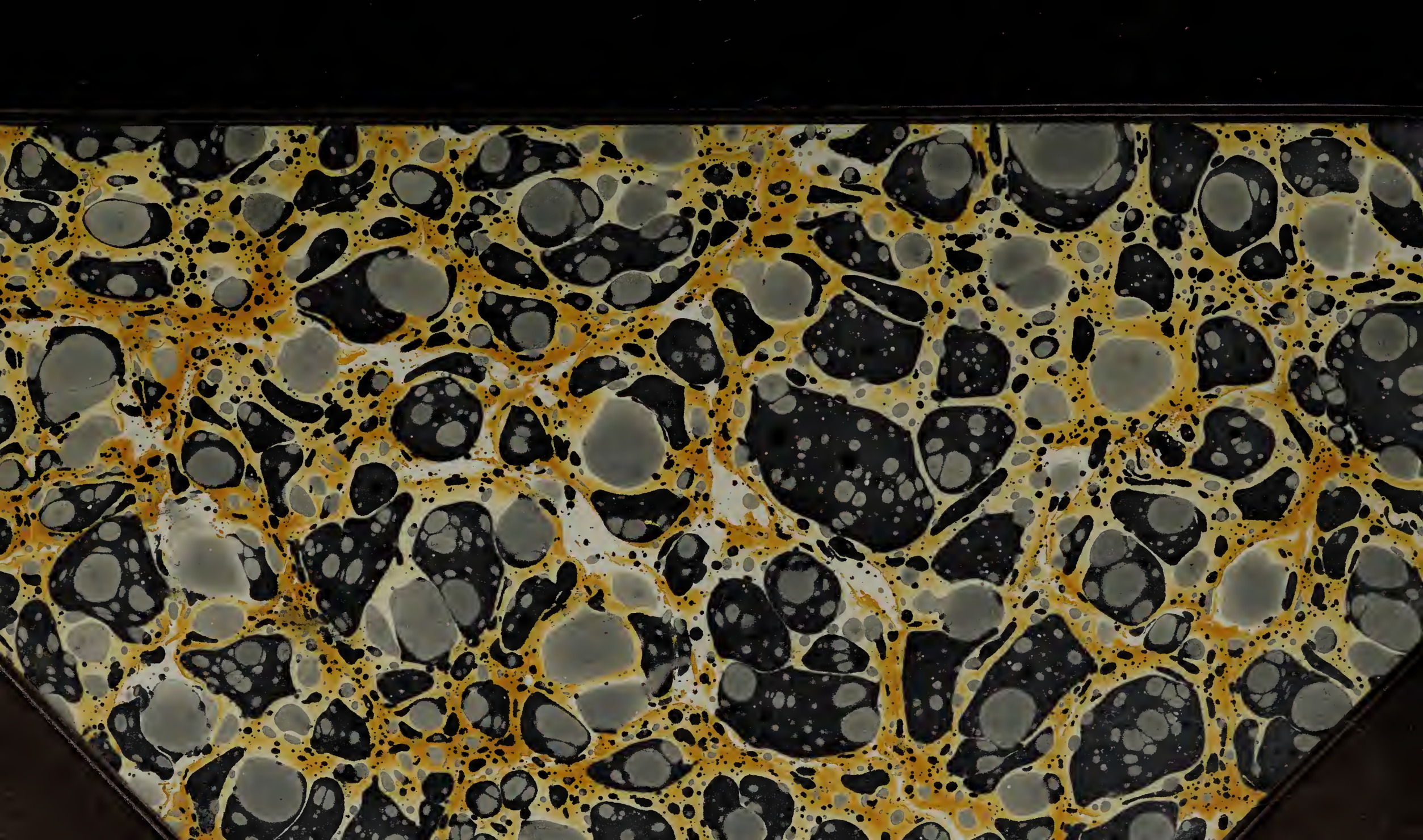
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